GS3 SERIES

COMPACT RECORDING CONSOLE

SERVICE MANUAL

About this manual...

This SERVICE MANUAL is for the ALLEN & HEATH GS3 range of compact recording consoles. This manual includes information on both the standard GS3 including upgrades and GS3V consoles, and replaces all previous issues of publication AP0123.

The information presented, is intended for competent technical personnel to carry out service and product support of this range of audio consoles. We assume that the reader is familiar with the relevant electronic theory, audio terminology, and is able to carry out basic servicing, fault-finding, and repair work to studio equipment of this type. Service personnel should also be familiar with studio and mains earthing as well as the power requirements and handling precautions.

Government and insurance underwriters' regulations on safety of electrical equipment must be observed at all times. These regulations take precedence over any suggestions in this manual.

PART A is a reprint of parts of the various OWNER MANUALS for quick reference to important user information. We recommend that you have a copy of the owner manual available for more complete information. This may also assist the service agent in dealing with user related problems. From our experiences with customer problems, most are due to incorrect use or installation of the console and/or connected equipment. This is often due to the customer not reading or misinterpreting the instructions in the owner manual.

PART B provides: technical descriptions, service and fault finding procedures, details on options such as expanding a standard console, and how to order spare parts. The contents of the standard service agent spares kits are also listed.

PART C presents a complete set of electronic circuit diagrams, printed circuit assembly component layout drawings, and the related assembly drawings.

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INTRODUCTION 1

The ALLEN & HEATH **GS3** series of ultra-compact professional audio mixing consoles is designed specifically to operate with the latest generation of multitrack tape machines and studio equipment.

The standard **GS3** features full on-board mute automation with built in sequencer, MIDI interface and programmable LEARN KEY facility. The **GS3V** adds VCA fader level automation and optional SMPTE interface.

The in-line format and versatile routing facilities allow up to 32-track recording and mixdown to two 2-track mastering machines without the need for re-patching. Both the 16 and 24 channel models are expandable to the full 32 channels if required. Four dedicated stereo effects returns and the two signal paths per channel provide a maximum of 40, 56 or 72 inputs all with EQ available for mixdown.

Your **GS3** benefits from the latest audio engineering technology as found in top of the range consoles costing many times the price. You can be sure that the sound quality of your original source will be preserved.

FEATURES:

- ▲ Advanced automation of fader levels and/or mute switching,
- ▲ 16-8-16-2 or 24-8-24-2 standard formats expandable to 32 channels,
- ▲ 8 groups normalled to channel outputs 1-8, 9-16, 17-24, 25-32,
- ▲ Up to 72 inputs each with EQ available for mixdown,
- ▲ In-line monitoring,
- ▲ Channel direct-to-tape switches allow up to 32 tracks to be recorded simultaneously,
- ▲ Separate EQ for channel and monitor paths, with EQ in/out switch,
- ▲ 6 aux busses providing effects and cue sends,
- ▲ Dedicated stereo cue monitor output with talkback,
- ▲ 4 stereo effects returns with EQ, cue sends and routing to all outputs,
- ▲ Monitoring and record source switching for two 2-track mastering machines allowing dubbing from one to the other,
- ▲ Dedicated stereo control room monitor output with switching for 2 pairs of loudspeakers.
- ▲ LED bargraph metering and separate channel peak LEDs,
- ▲ Inserts for signal processing on channels, groups and stereo mix,
- ▲ Comprehensive monitor and talkback facilities,
- ▲ 2 frequency line-up oscillator,
- ▲ 100mm faders and quality components used throughout,
- ▲ Superior audio performance, engineered for reliability.

SPECIFICATION

Figures quoted are typical of the 16 channel GS3
0dBu = 0.775Vrms, 0dBV = 1Vrms
0VU = normal operating level (reading "0" on the meters)

OPERATING LEVELS: Multitrack in/out -10dBV
2-track in/out -10dBV
FX, cue out etc. 0dBu normal line level
Inserts 0dBu normal line level

FREQUENCY RESPONSE: 20Hz to 20kHz +0dB, -1dB

NOISE: Measured rms 22Hz to 22kHz
Microphone EIN -127 dBu source = 150 ohm
LR Mix noise -80 dB ref 0VU
Group mix noise -80 dB ref 0VU

CROSSTALK: better than -80dB at 1kHz

DISTORTION: THD typically less than 0.008% at 1kHz
less than 0.02% at 10kHz

GAIN: Mic input variable from +10dB to +70dB
Line input variable from -10dB to +20dB
further +10dB available at each fader

MAXIMUM OUTPUT LEVEL: +21dBu into 2k ohms min.

CONSTRUCTION:
Single steel front panel and base plate with Medite side trims. Large extruded aluminium armrest incorperating carrying handle and pen slot / write-on strip. Extruded aluminium rear member incorperating lifting lip. Multiple circuit assemblies connected by removable IDC harnesses for easy service access. Separate stand alone MPS9 external power supply unit. X8 expander attaches on right hand side of console to expand it by 8 channels to a maximum of 32 channels.

For size and weight please refer to the section **Getting Started.**
For connector details refer to the section **About Your Console.**

GETTING STARTED 2

THE PACKING

Your console has been shipped in a purpose designed box to protect it from damage. Please keep this packing and ensure that the console and power supply are correctly repacked should you need to ship them in the future. Before starting check the contents list on the packing diagram which is enclosed with the console.

WARRANTY REGISTRATION

To ensure proper validation and handling of warranty services please complete and return the WARRANTY REGISTRATION CARD enclosed to Allen & Heath. Keep a log of the console and power unit serial numbers and quote these in any communication regarding this product.

LOOKING AFTER YOUR CONSOLE

To preserve the working life and looks of your console please observe these simple precautions:

CLEANING: Use only a clean damp cloth and soft brush. Avoid the use of chemicals, abrasives and solvents. To remove stubborn marks (such as chinagraph pencil) isopropyl alchohol may be used.

LUBRICATION: The faders, switches and potentiometers are lubricated for life. The use of electrical lubricants on these parts is not recommended.

DIRT, DUST, SMOKE and MOISTURE: Prevent damage to the moving parts such as faders and potentiometers, and to the cosmetics by avoiding drinks spillage, tobacco ash and smoke, and exposure to rain and condensation.

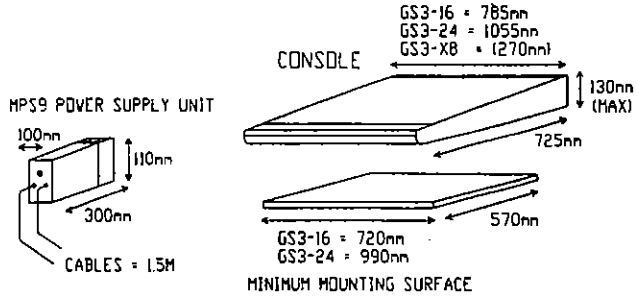
HEAT and VIBRATION: Avoid storing, transporting or operating your console in conditions of excessive heat or cold, or where it may be subject to excessive vibration or mechanical shock.

Treated with care your console should continue to give you trouble-free and reliable operation.

POSITIONING THE CONSOLE AND POWER UNIT

WEIGHT:

GS3-16 = 18kg
GS3-24 = 24kg
MPS9 = 3kg



POSITIONING THE CONSOLE:

Your console is designed for table-top mounting. Use a sturdy flat surface of at least the dimensions shown above. The top panel connectors allow the console to be pushed up against a wall if space is limited.

Make sure the console is positioned to avoid excessive vibration, moisture, condensation, or extremes of temperature.

POSITIONING THE POWER SUPPLY:

The MPS9 power supply is a free-standing unit which is best positioned at least 1 metre away from the console to avoid introducing mains hum into the sensitive audio circuits.

Allow space around the unit for ventilation. As with most power units the MPS9 runs warm and is cooled by air flow across its heatsinks. Do not cover the MPS9 or restrict the air flow around the unit.

CONNECTING THE POWER SUPPLY

Connect your GS3 console only to the ALLEN & HEATH power supply unit which is included. The standard unit for the GS3 is the MPS9.

The power unit mains lead should only be connected to your local AC mains supply of 50/60Hz.

Check the power unit label for the correct AC mains voltage setting.

If your power unit is not supplied with a fitted mains plug carefully connect an approved mains plug observing the following standard colour coding:

BROWN = LIVE
BLUE = NEUTRAL
GREEN/YELLOW = EARTH (GROUND)

EARTHING THE AUDIO SYSTEM

Earthing/grounding in an audio system is provided for two purposes:

1. **SAFETY** - prevention of electric shock

2. **SHIELDING** - prevention of external electrical interference causing noise on the wanted audio signal.

In addition to preventing problems, earthing can also cause them. If there are multiple earth paths within the system then an "earth loop" may result. This causes interference on the audio signal which is usually heard as a low frequency background hum or buzz.

The preferred method to prevent earth loop problems is to earth all pieces of equipment separately to a good noise-free "star point" mains earth, and to break potential earth loops by connecting the screens of audio cables to earth at one end only. If excessive RF interference is present this may be reduced by linking the disconnected screen to earth through a small capacitor, typically 0.01 microfarad.

SAFETY !

Mains electricity is dangerous and can kill. Mains voltage is present within the power unit but not the console itself. Check your mains wiring and earthing before switching on.

The purpose of the "earth" (ground) connection in a mains supply system is for the prevention of electric shock from the high voltages present. It is usual for the cases of mains powered equipment to be connected to earth to prevent the metal parts becoming "live" and causing electric shock. Some are "double insulated" and do not need this. Your power supply must be connected to a suitable mains earth through its mains cable green/yellow wire.

The power supply case earth is not connected to the console earth. Your console should be connected via a different path to earth. This is done through the audio system cables in a way that avoids interference due to earth (ground) loops. Check your system with a meter to ensure continuity from all equipment to mains earth before switching on.

Equipment will continue to work if it is not earthed. This does not mean that it is safe. GOVERNMENT AND INSURANCE UNDERWRITERS ELECTRICAL CODES MUST BE OBSERVED. These codes take precedence over any suggestions in this manual.

POWER UP CHECK

We recommend that you carry out this brief "confidence test" before installing the rest of your system.

1. Plug the 5-pin power unit connector into the console **DC INPUT** socket.
2. Switch on AC power and check that the console display reads "0". You may notice the bargraph displays and console LEDs flash briefly as the power rails stabilise. This is quite normal.
3. Set the eight **GROUP FADERS** to position "0".
4. Press the **OSC TO GROUPS** switch in the right hand master section and raise the **OSC LEVEL** control. You should see the bargraph meter columns illuminate as you turn the control.
5. Plug in your headphones (under the armrest near the master section), press a **GROUP PFL** switch and raise the **CONTROL ROOM LEVEL** control. You should now hear a 1kHz sinewave tone.
6. Toggle each **MUTE SWITCH** in turn checking that the LEDs light correctly.

This checks that the power unit and console are operating correctly. You should now continue with the installation.

PLUGGING UP THE CONSOLE

Refer to the section **About your console** to familiarise yourself with the function and interfacing requirements of each section of your console before plugging up. If you are unsure of what to plug where or the terms referred to please read the section **Installation Basics** first.

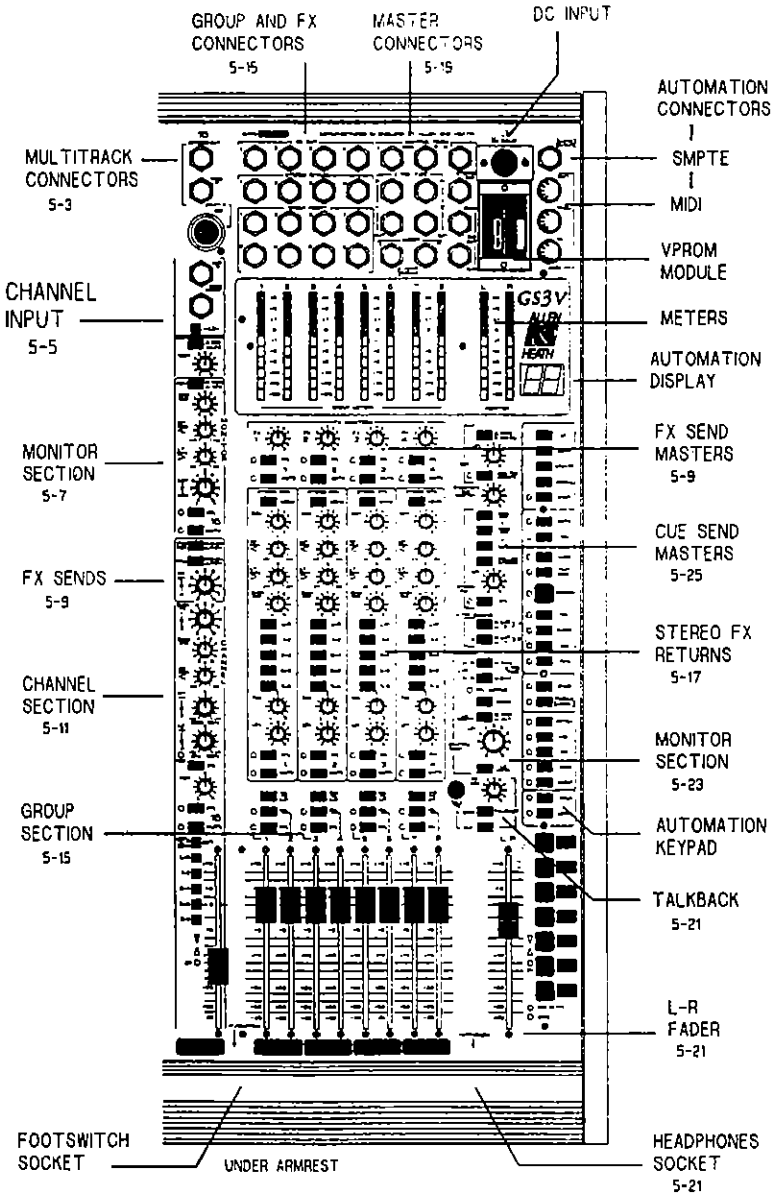
Use audio connectors and cables only for the purpose intended. Avoid connecting the console to circuits which include DC voltages or AC voltages other than low power audio signals. Do not connect the output of power amplifiers directly to the console.

Make sure that the equipment you are connecting your console to is correctly earthed.

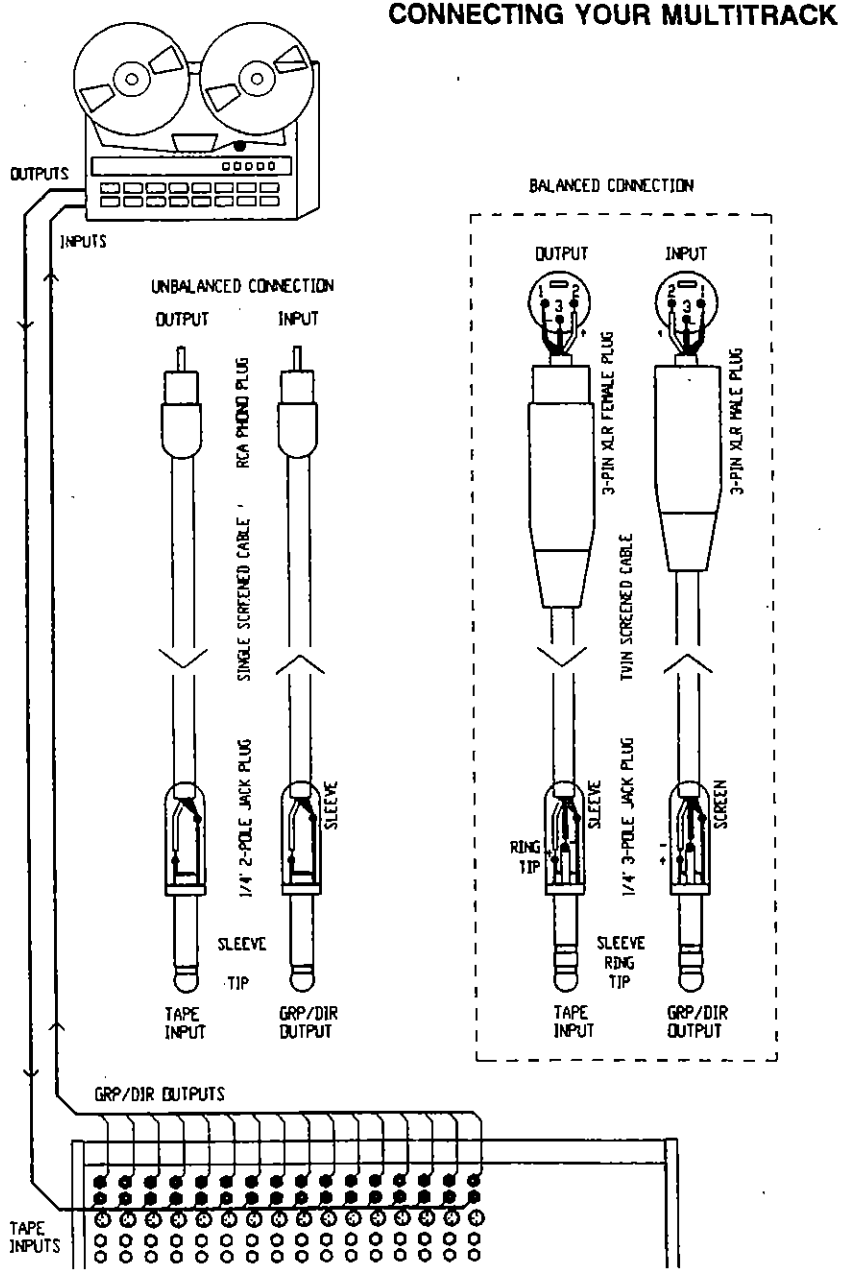
Avoid running audio cables close to power units, mains or computer cables and equipment. In particular, do not place computer VDU monitors next to the console or audio cables as this may cause audible interference or buzz.

We suggest that you set all the faders, gain and level controls to the off (minimum) position first to prevent possible damage to your loudspeakers or ears as you connect up the system.

ABOUT YOUR CONSOLE 5



CONNECTING YOUR MULTITRACK



MATCHING THE CONSOLE TO YOUR MULTITRACK

The GS3 Series console is factory set for operation with low level (-10dBV) multitrack recorders. For operation with high level (+4dBu) recorders please refer to the section **OPTIONS AND EXTRAS.** For correct cable type refer to your multitrack owner manual.

GRP/DIRECT OUTPUT 1/4" 3-pole A-gauge jack socket to connect the console output to your multitrack recorder input. This output may be switched to send either the CHANNEL post-fader (direct) signal, or the related one of eight groups as shown in TABLE 1.

unbalanced output
tip = + (signal)
ring = - (ground)
sleeve = 0V (ground)
Output Impedance < 50 ohms low
Nominal level = -10dBV low operating level

TAPE IN 1/4" 3-pole A-gauge jack socket to connect your multitrack recorder output to the console input. Connect each track to its corresponding console channel number.

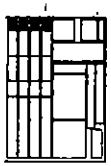
unbalanced input
tip = + (signal)
ring = - (ground
sleeve = 0v (ground)
Input Impedance = 15k ohm
Sensitivity = -10dBV low operating level

TABLE 1.

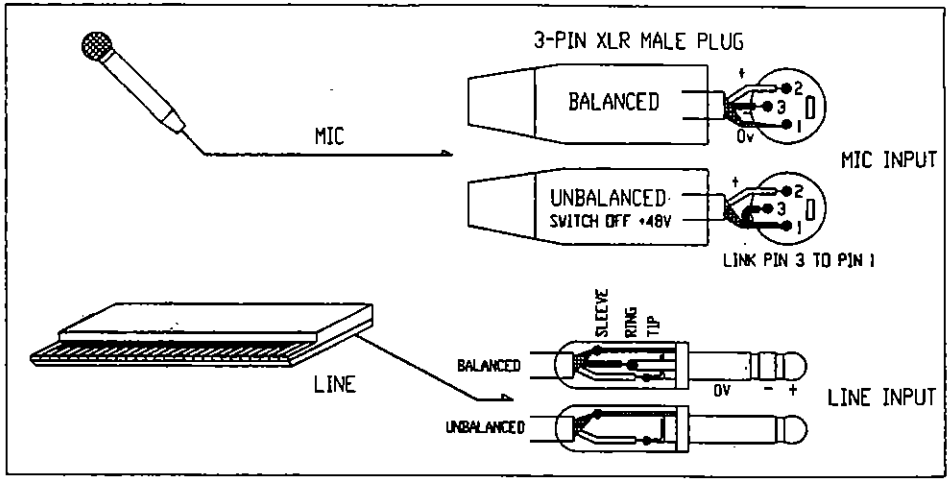
Console	Group	Multitrack
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	1	9
10	2	10
11	3	11
12	4	12
13	5	13
14	6	14
15	7	15
16	8	16
17	1	17
18	2	18
19	3	19
20	4	20
21	5	21
22	6	22
23	7	23
24	8	24
25	1	25
26	2	26
27	3	27
28	4	28
29	5	29
30	6	30
31	7	31
32	8	32

MULTITRACK CONNECTORS

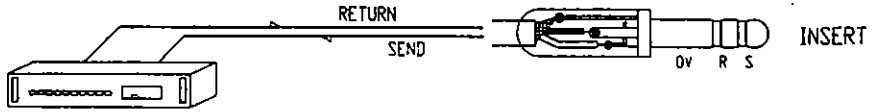
These connectors interface the console to your multitrack recorder.

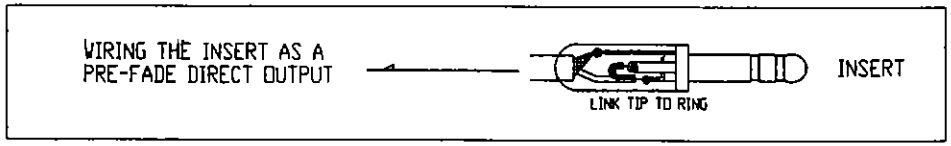


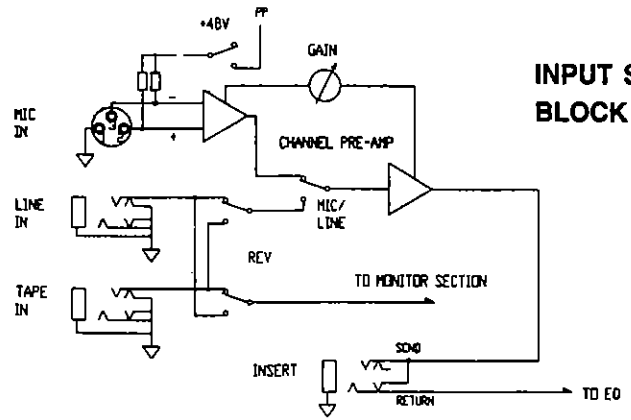
PLUGGING UP THE SOURCE



INSERTING AN EFFECT







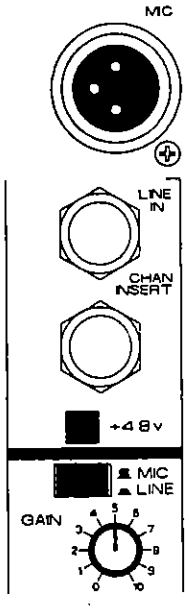
INPUT STAGE BLOCK DIAGRAM

MICROPHONE INPUT 3-pin Female XLR to connect low impedance low level (mic) signals into the channel.

pin 2 = + (hot) electronically balanced
pin 3 = - (cold)
pin 1 = 0V (ground)
Input impedance = 2k ohm
Sensitivity = -68dBu to -9dBu

LINE INPUT 1/4'' 3-pole A-gauge jack socket to connect high level (line) signals into the channel. Will accept balanced or unbalanced signals.

tip = + (signal) unbalanced
ring = - (ground)
sleeve = 0v (ground)
Input Impedance = 15k ohm
Sensitivity = -20dBu to +10dBu



CHANNEL INSERT 1/4'' 3-pole A-gauge jack socket break point to insert signal processing devices into the channel audio path. With nothing plugged in the send is internally connected to the return.

tip = send (from the channel pre-amp stage)
ring = return (to the channel Equaliser stage)
sleeve = 0V (ground) Nominal level = 0dBu

PHANTOM POWER (+48v) Switches the internal +48V phantom power to the MIC input connector. Use only with balanced microphones requiring powering. Always switch this off (up position) when plugging or unplugging microphones.

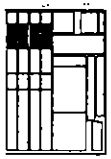
MIC/LINE Selects the LINE input when pressed, or the MIC input when released, as the source to the channel pre-amp stage. The TAPE input becomes the source if both the LINE and REV switches are pressed.

GAIN Adjusts the sensitivity of the input pre-amp stage to match the input signal level to the normal operating level of the console. Use the console PFL system to check for correct gain setting.

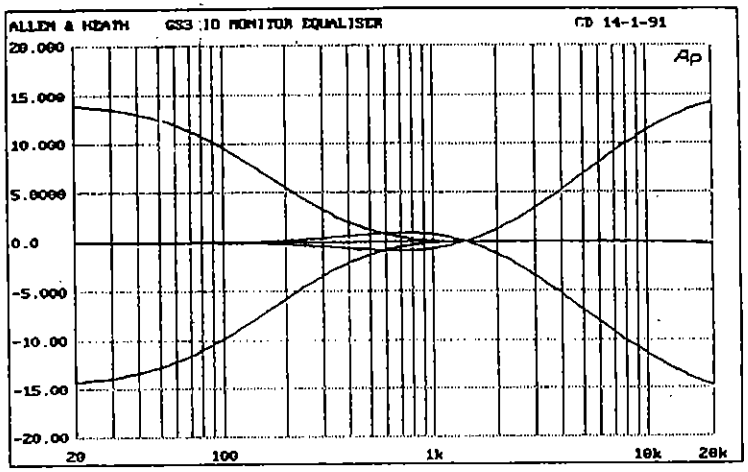
MIC sensitivity = -68dBu to -9dBu
LINE sensitivity = -20dBu to +10dBu

CHANNEL INPUT SECTION

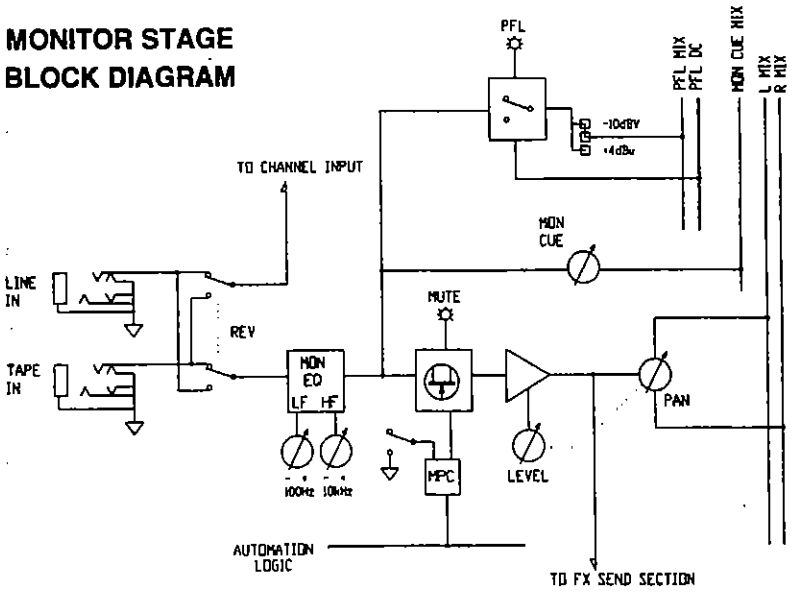
This is the input pre-amplifier stage that you use to select and match the input source to the CHANNEL signal path.

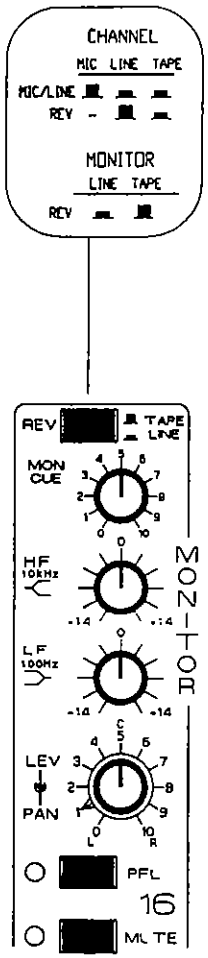


MONITOR EQUALISER RESPONSE



MONITOR STAGE BLOCK DIAGRAM





REV Reverses the LINE and TAPE inputs allowing you to route the multitrack tape return through the CHANNEL path and use the MONITOR path for additional line inputs during the mixdown process. The selected source for both paths is as shown here at left.

MON CUE Adjusts the level of pre-fade pre-mute programme being sent from the MONITOR path to the MONITOR CUE buss. This allows you to create a dedicated monitor foldback mix.

HF Provides high frequency (treble) cut and boost in the MONITOR path. Flat response at centre click position.

+/-14dB 10kHz shelving equaliser

LF Provides low frequency (bass) cut and boost in the MONITOR path. Flat response at centre click position.

+/-14dB 100Hz shelving equaliser

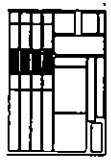
LEV/PAN The top control adjusts the MONITOR signal level in the stereo (L-R) mix. The lower control adjusts the position within the stereo image. This sends equal signal to left and right at the centre click position.

PFL Allows the pre-fade MONITOR signal to be checked through the control room output or headphones without interrupting the recorded programme. The signal level is displayed on the L and R meters.

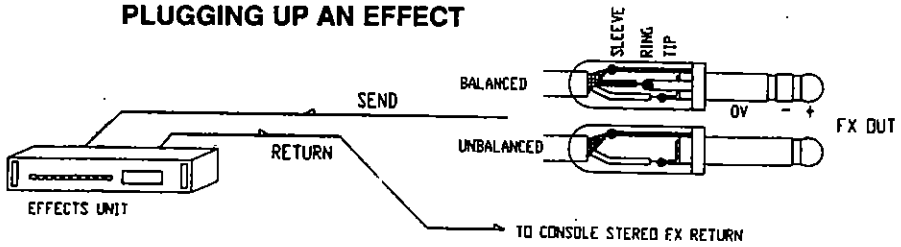
MUTE This momentary action switch toggles the MONITOR signal off (muted, LED on) or on. Switches the signal to the stereo (L-R) mix and FX sends but not the cue system. The mute is controlled by the console computer memory system providing a high degree of mute automation.

MONITOR SECTION

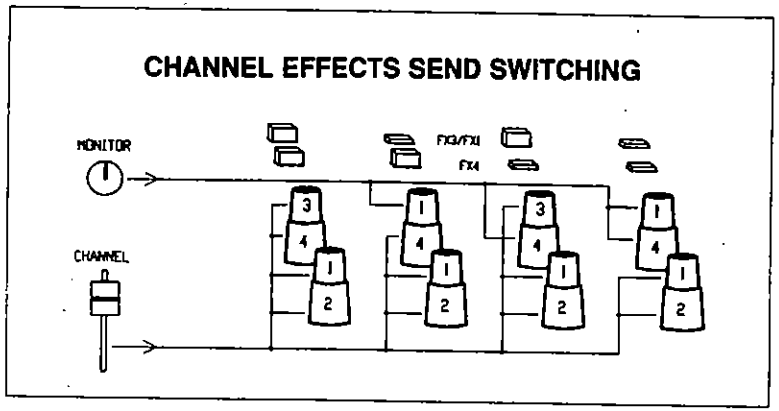
This is the smaller of the two channel input paths, normally used during multitrack overdubbing to monitor the tape return signals, and during mixdown for additional line inputs such as effect returns to the stereo mix.



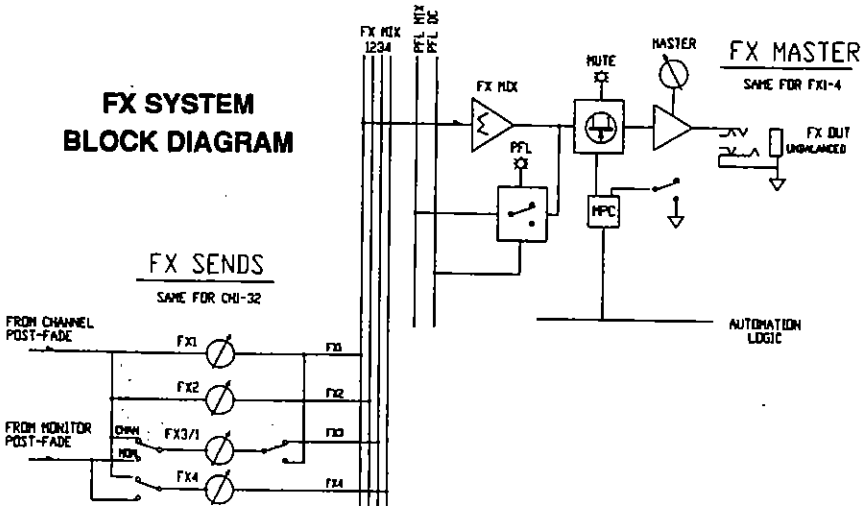
PLUGGING UP AN EFFECT



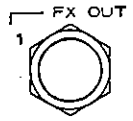
CHANNEL EFFECTS SEND SWITCHING



FX SYSTEM BLOCK DIAGRAM



FX OUT 1/4" 3-pole A-gauge jack sockets to connect the post-fade FX mix (1 to 4) to external line level effects or signal processing devices.

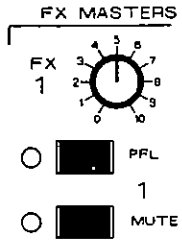


tip = + (signal) unbalanced
ring = - (ground)
sleeve = 0v (ground)
Output Impedance < 50 ohms low
Nominal level = 0dBu

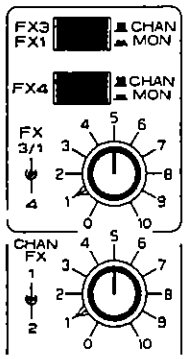
FX MASTER LEVEL Four controls adjust the final output level of the FX mix to external effects devices.

PFL Allows the pre-level FX mix signal to be checked through the control room output or headphones without interrupting the recorded programme.

MUTE This momentary action switch toggles the FX output signal off (muted, LED on) or on. The mute is controlled by the console computer memory system allowing creative effects automation.



FX SWITCHING Two switches enable you to source the FX sends from the CHANNEL and MONITOR post-fade signals as you require. This flexible system allows both signal paths to access FX1 making it ideal for your primary effects unit such as a reverb. The monitor source may be switched to FX4 giving it a dedicated effects send, or all four effects may be switched into the CHANNEL path. Refer to the diagram opposite.

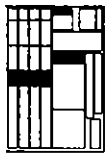


FX3/1,4 SENDS This dual-concentric control adjusts the individual send levels as selected using the above switches.

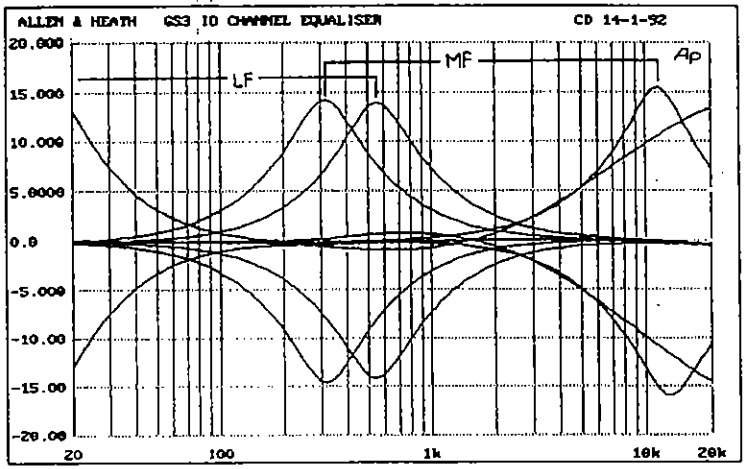
FX1,2 SENDS These controls adjust the CHANNEL post-fade signal level to FX1 (top control) and FX2 (lower control).

FX (EFFECTS) SENDS

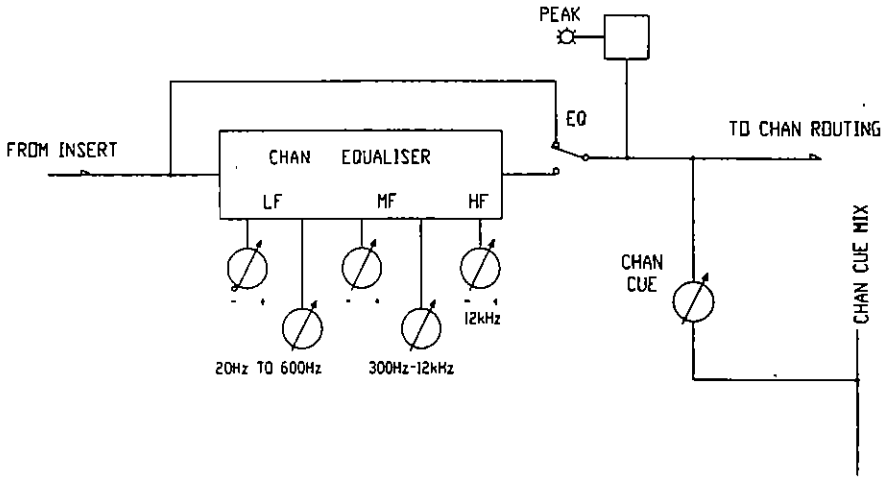
You may create up to four different post-fade mixes to be used with external effects devices such as reverb. These are normally arranged as send/return loops. Sometimes known as "echo".



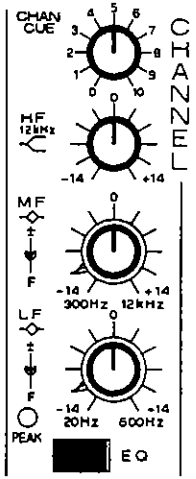
CHANNEL EQUALISER RESPONSE



CHANNEL CUE, EQ AND PEAK BLOCK DIAGRAM



CHAN CUE Adjusts the level of pre-fade pre-mute programme being sent from the CHANNEL path to the CHANNEL CUE buss. This allows you to create a dedicated channel foldback mix.



HF Provides high frequency (treble) cut and boost in the CHANNEL path. At the centre click-stop position the response is not affected.

+/-14dB 12kHz shelving equaliser

MF This dual concentric control provides swept mid frequency cut and boost in the CHANNEL path. The top control gives you cut and boost. At the centre click-stop position the response is not affected. The lower control sweeps the peak/dip frequency.

+/-14dB from 300Hz to 12kHz peak/dip equaliser

LF Thid dual concentric control provides swept low frequency (bass) cut and boost in the CHANNEL path. The top control gives you cut and boost. At the centre click-stop position the response is not affected. The lower control sweeps the peak/dip frequency.

+/-14dB from 20Hz to 600Hz peak/dip equaliser

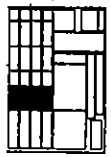
EQ Switches the equaliser into the CHANNEL path when pressed. This lets you compare the equalised programme with the original at the press of a switch.

PEAK Illuminates when CHANNEL audio signals approach overload, showing the equalised audio level.

Turns on 3dB before clipping (distortion)

CHANNEL SECTION - CUE, EQUALISER and PEAK

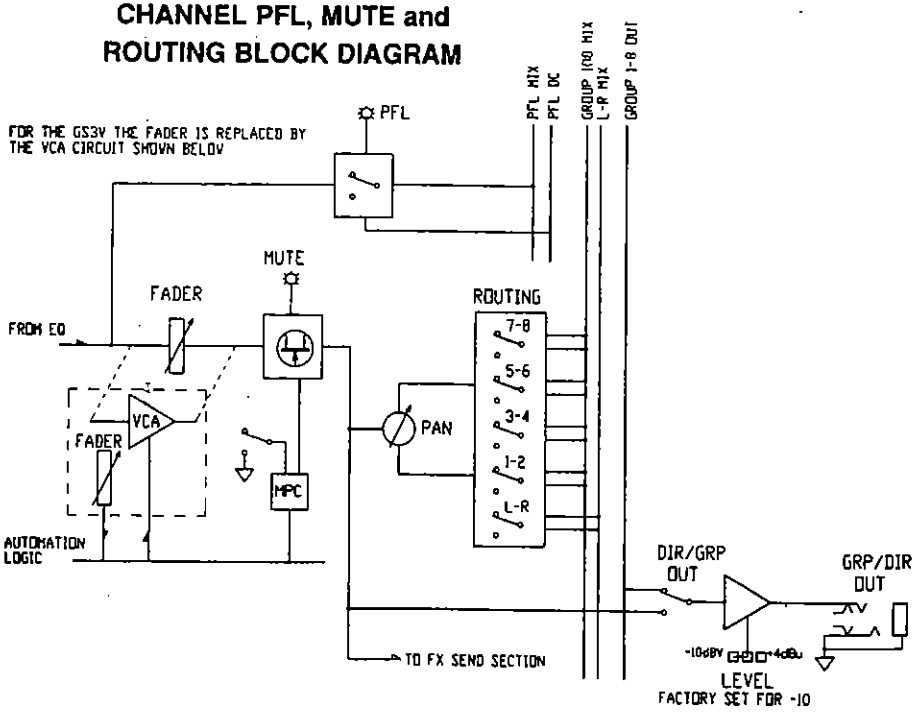
This is the main channel signal path, normally used for mixing the sources to the tape tracks during multitracking, and for processing and mixing the tape tracks during mixdown to stereo.

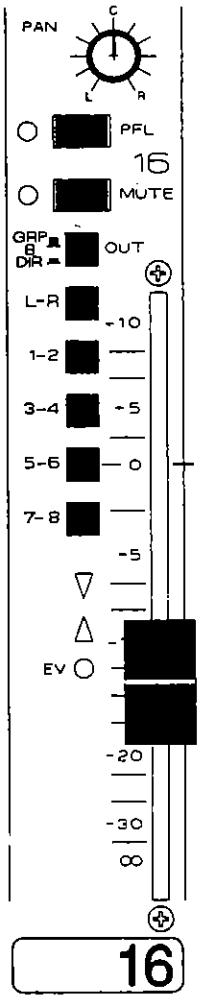


MARKING UP YOUR CHANNEL A scribble strip is provided below the fader for you to write on the channel source or other session information. We recommend that you use a chinagraph pencil or other easily erasable marker to avoid permanent damage to the mixer finish. The armrest includes a 1 inch wide slot which you may use as a pencil recess or for further channel identification using a strip of lightly adhesive draughting tape. Do not write directly on to the armrest as this may damage the finish.

VCA FADER AUTOMATION Available on the **GS3V** console version this advanced system replaces the CHANNEL audio fader with a high performance VCA (Voltage Controlled Amplifier). The fader sends a DC control voltage proportional to its position to the console automation computer which returns the related voltage to the VCA, so setting the signal level. The computer memory system, built-in sequencer and interface to external music equipment lets you record, replay and synchronise the fader levels automatically, as well as create master/slave fader subgroups, thus expanding the creative potential of your recording system. Refer to the separate **AUTOMATION** manual for full details.

CHANNEL PFL, MUTE and ROUTING BLOCK DIAGRAM





PAN Position the CHANNEL signal between the left and right outputs of the stereo mix. Full counter-clockwise routes all of the signal to the left output, and full clockwise to the right. At the centre click-stop position the signal is centred in the stereo image.

PFL Allows the pre-fade CHANNEL signal to be checked through the control room output or headphones without interrupting the recorded programme.

MUTE This momentary action switch toggles the CHANNEL signal off (muted, LED on) or on. This affects the signal to all outputs except CUE. The mute is controlled by the console computer memory system providing a high degree of mute automation.

GRP/DIR OUT When pressed , this sends the post-fade post-mute CHANNEL signal to the channel output connector (direct to multitrack). When released, the related one of eight group outputs is sent to this connector. The group outputs are internally patched to the channel outputs as shown in the table on page 5-3.

This gives you the advantage of being able to record as many tracks as you have on your multitrack simultaneously without any repatching.

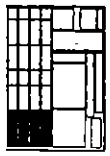
L-R Switches the post-pan CHANNEL signal to the main stereo output. This output is normally connected to your 2-track recorders.

ROUTING 1-2 to 7-8 Switches the post-pan CHANNEL signal to the eight groups in stereo pairs. These groups would normally be used for mixing signals to the multitrack, or for subgrouping to the stereo mix.

CHANNEL FADER Controls the level of the CHANNEL signal to all the outputs except the CUE system and inserts. The mark "0" is the normal operating position (unity gain) and a further 10dB of boost is available at the top position. The **GS3V** version includes UP, DOWN and EVENT indicators which show the status of the VCA fader system.

CHANNEL SECTION - PFL, MUTE, ROUTING and FADER

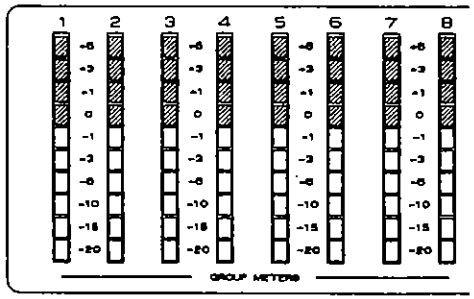
This is the main channel input path, normally used for mixing the sources to the tape tracks during multitracking, and for processing and mixing the tape tracks during mixdown to stereo.



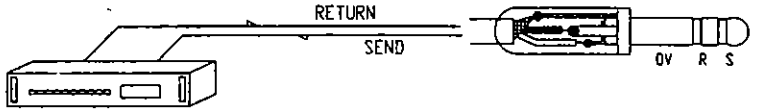
THE GROUP METERS

Each group has a peak reading 10 segment 2 colour bargraph meter which reads the post-fade GROUP output signal presented to the channel GRP/DIR outputs.

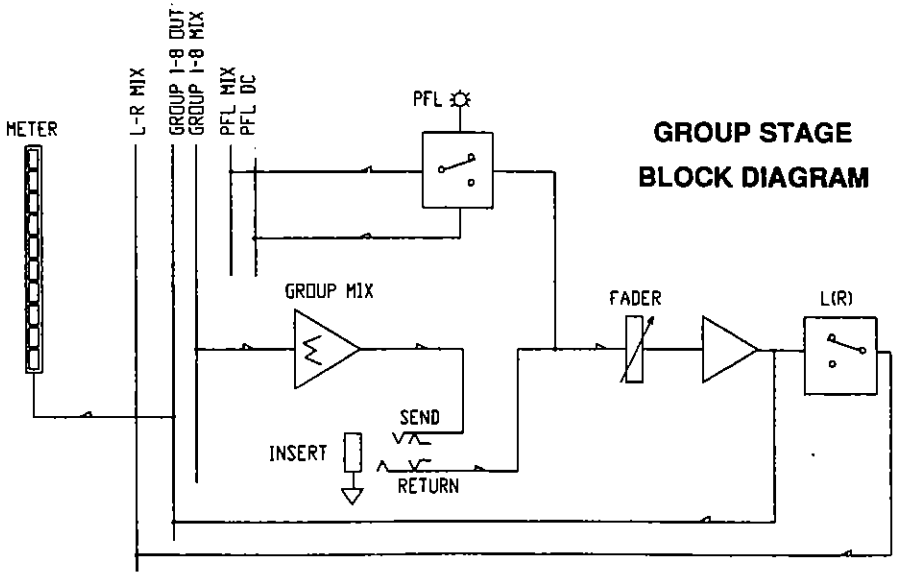
The normal operating level "0" is indicated by the first red LED. For optimum performance operate the console with the meters averaging "0" or just below with occassional peaks into the "red".

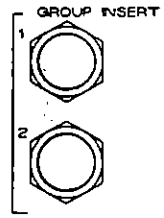


INSERTING A PROCESSING DEVICE



GROUP STAGE BLOCK DIAGRAM



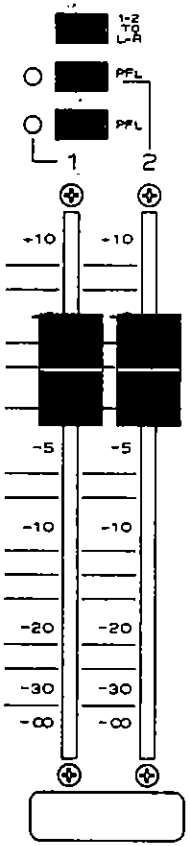


GROUP INSERT 1/4" 3-pole A-gauge jack socket break point to insert signal processing devices into the group audio path pre group fader. With nothing plugged in the send is internally connected to the return.

tip = send (from the group mix amp)
ring = return (to the group fader)
sleeve = 0V (ground) Nominal level = 0dBu

You would normally use these inserts for signal processing devices such as compressors or limiters, or group effects devices such as delays.

Depending on the connector requirements of your external device you may need to use a suitable splitter lead. For further details please refer to the section **Installation Basics.**



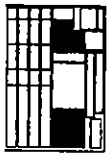
GRP TO L-R Feeds the group outputs directly to the stereo mix in pairs, odd groups to Left, even to Right. This lets you group several channel signals together under the control of a single pair of "master" faders which feed the main stereo mix. This is known as stereo subgrouping. Typical applications include grouping of several drum kit or backing vocal microphones.

PFL Lets you check the pre group fader signal through the control room monitors or headphones without interrupting the recorded program. PFL is after the insert and before the group fader so that you may check the signal after processing and with the fader down. Each group has its own PFL switch.

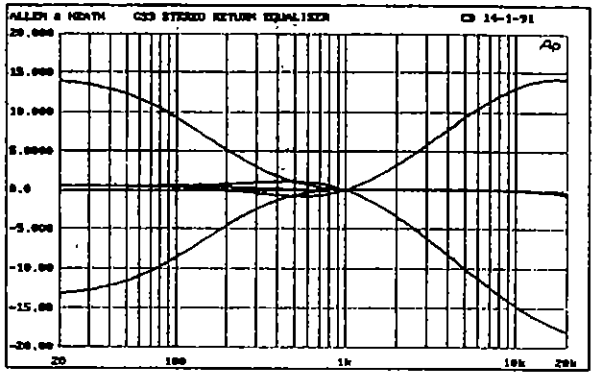
GROUP FADER Controls the level of the group signal. The "0" mark is the normal operating position (unity gain) and a further 10dB of boost is available at the top position. In the down position the programme is shut off fully.

GROUP MASTERS and METERS

This section gives you master level control and monitoring of the eight group mix outputs, and lets you set up subgroups to the stereo mix.



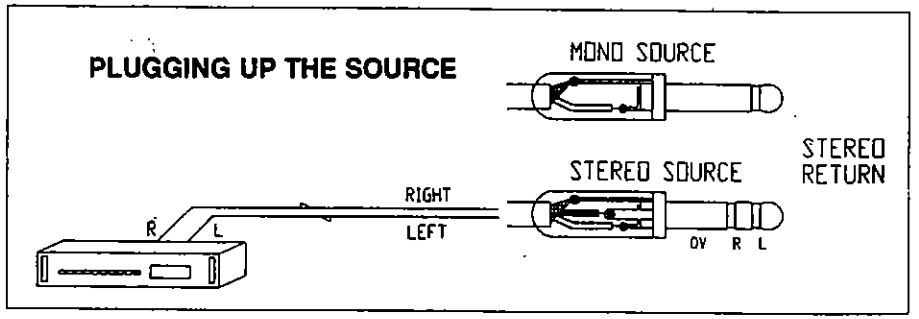
RETURN EQUALISER RESPONSE

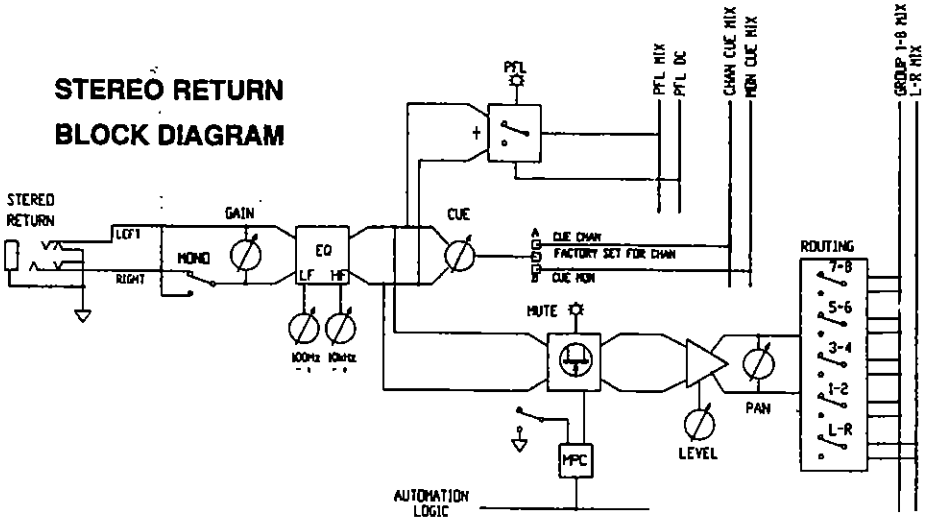


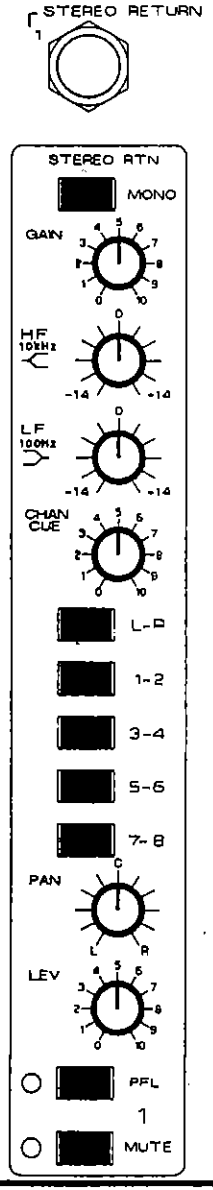
STEREO RETURN

1/4" 3-pole A-gauge jack sockets to connect the outputs from your stereo or mono effects devices to the return channels.

unbalanced
tip = left (or mono)
ring = right
sleeve = 0V (ground)
sensitivity =
-12dBu to +4dBu







MONO Switches the left input (tip signal) to both the left and right channels. This gives you the option of plugging in either a stereo or a mono source.

GAIN Adjusts the sensitivity of the input stage to match the source to the channel.

sensitivity = -12dBu to +4dBu

HF and LF These controls provide high frequency (treble) and low frequency (bass) cut and boost respectively in the return path. In the centre click-stop position the response is flat.

+/-14dB 10kHz, 100Hz shelving equaliser

CHAN CUE Adjusts the pre-mute, pre-level programme being sent from the return path to the CHANNEL CUE buss to feed your musicians foldback mix.

ROUTING L-R, 1-2 to 7-8 Switches the post-pan return signal to the stereo mix or groups in stereo pairs.

PAN Adjusts the balance between the left and right channels of your stereo source, or positions your mono source within the stereo image. At the centre click-stop position the signal is equally balanced or centred.

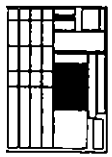
LEV This controls the level of the return signal to the selected outputs in much the same way as the faders do for the channels. Unity gain is position "7" giving you a further 10dB of gain at the maximum position.

PFL Lets you check the pre-level return signal through your monitors without interrupting the recorded programme. The left and right signals are combined.

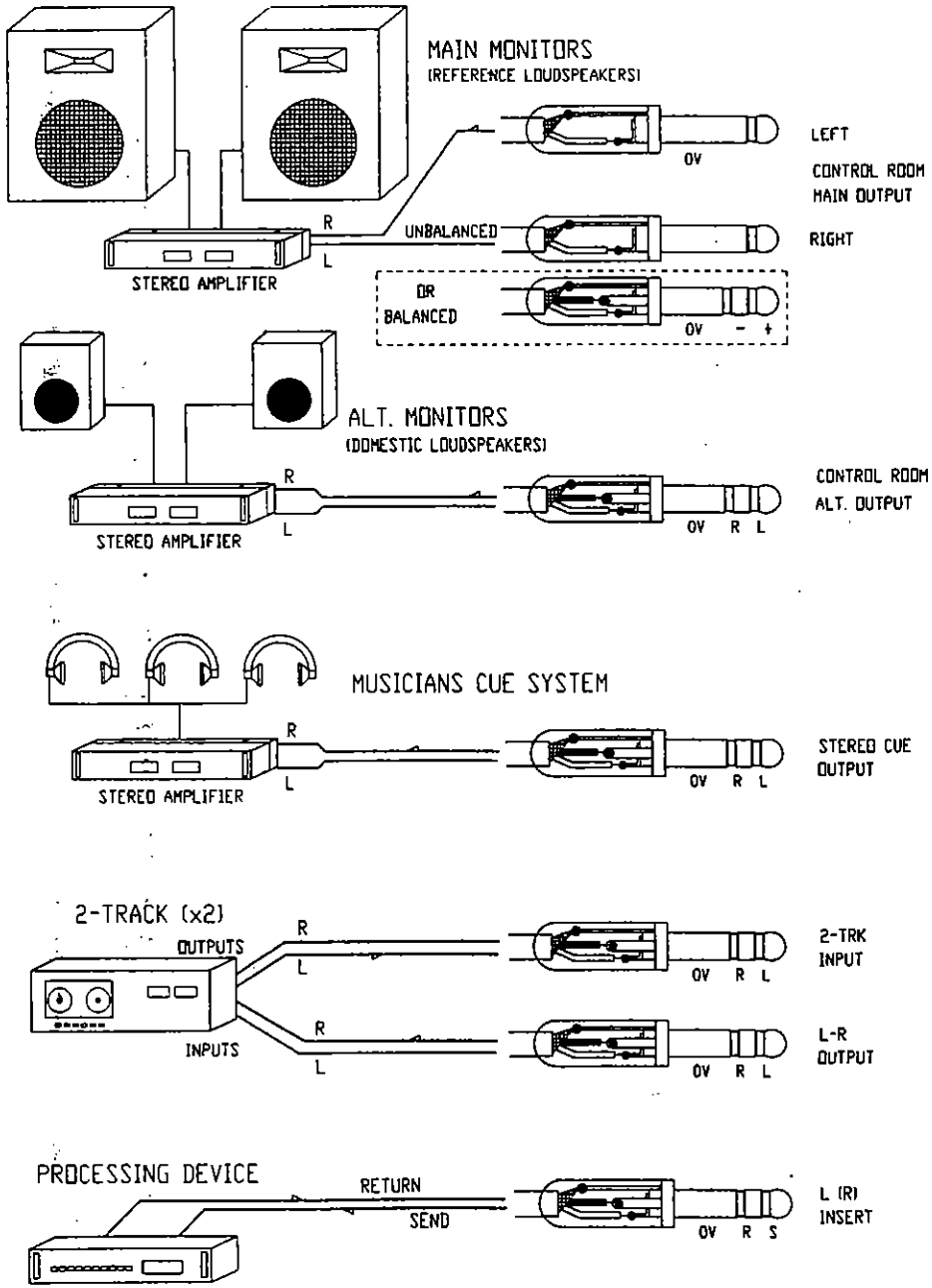
MUTE This momentary action switch toggles the return signal off (muted, LED on) or on under control of the console computer memory system. This affects the signal to all the outputs except CUE.

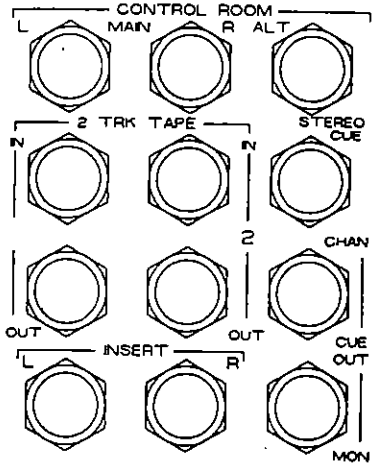
STEREO RETURNS

Four full function stereo input channels let you return the processed signals from your stereo or mono effects devices, or give you yet more line inputs to your multitrack or stereo mix.



PLUGGING UP YOUR MASTER SECTION





THE CONNECTORS

These are .1/4" 3-pole A-gauge jack sockets. Some are stereo function, ie. one connector provides both left and right signals. Where your equipment has individual connectors for each signal you shall need to use a suitable splitter lead. Refer to the section **Installation Basics** for details.

This does not apply to the MAIN monitor outputs which are on separate sockets and may interface to both balanced or unbalanced amplifiers.

CONTROL ROOM MAIN L and R Connects to your main monitor system so that you may listen to the audio quality of your programme. Connect to a high quality stereo amplifier and pair of reference loudspeakers.

tip = + (signal) unbalanced MONO PINOUT
ring = - (ground)
sleeve = 0v (ground) Nominal level = 0dBu

CONTROL ROOM ALT Connects to your alternate stereo amplifier and domestic quality loudspeakers (sometimes called "squawk").

tip = left signal unbalanced STEREO PINOUT
ring = right signal unbalanced
sleeve = 0v (ground) Nominal level = 0dBu

STEREO CUE Connects to your studio stereo amplifier and pair of loudspeakers or musicians foldback headphone ring . You may use the built in talkback system to talk to this output. Stereo pinout as above.

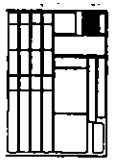
CHAN and MON CUE Provide separate outputs from the CHANNEL path and MONITOR path mix busses, useful for providing extra foldback sends. Mono pinout as above.

2-TRK TAPE IN and L-R OUT two pairs of sockets to connect to your two 2-track (stereo) mastering machines such as DAT and cassette recorders. Your console lets you dub between these recorders. Stereo pinout as above.

L and R INSERT Allows you to insert external processing devices such as compressors before the L-R faders. Pinout as the channel and group inserts.

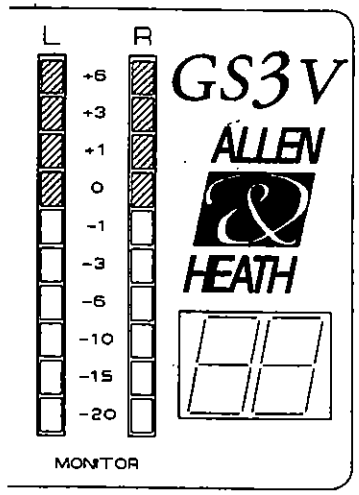
MASTER CONNECTORS

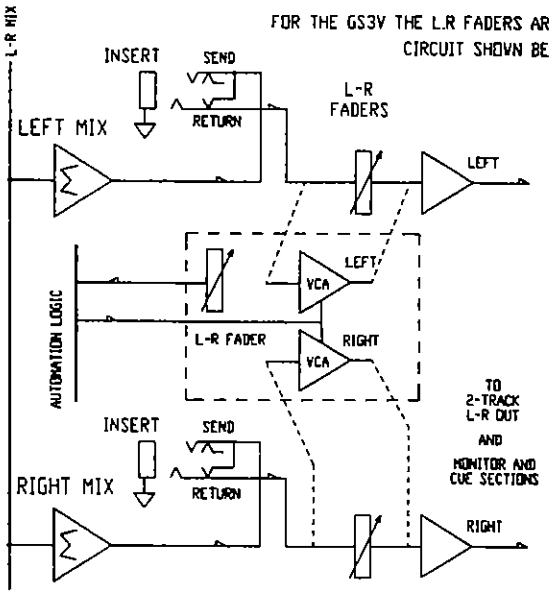
Interface the console to your 2-track recorders, musicians cue systems, and two amplifier/loudspeaker monitoring systems.

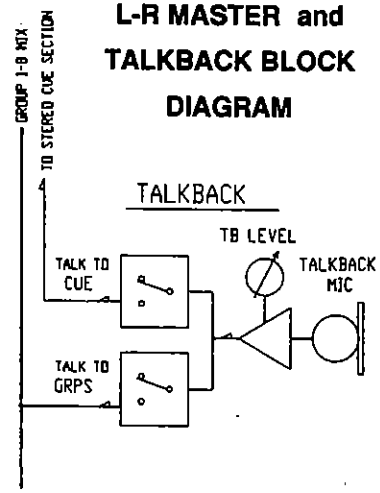


THE L-R / MONITOR METERS

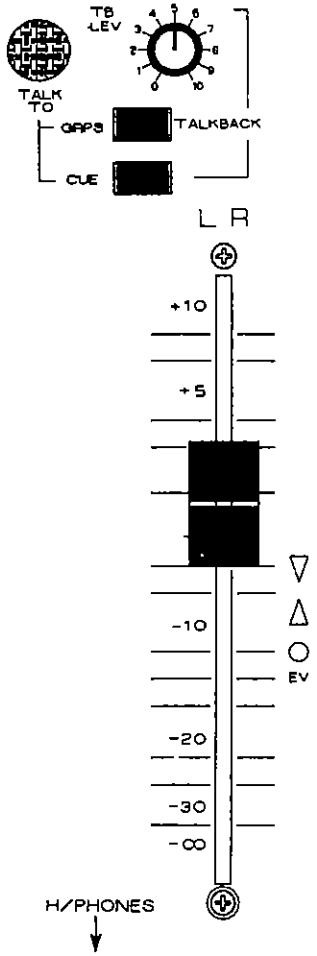
Two peak reading 2 colour 10 segment bargraph meters read the selected control room monitor source , usually the post-fade L-R (stereo) mix. When you press PFL (or AFL) both meters automatically switch to read the mono PFL/AFL source, useful for setting the channel gain controls for the optimum operating level. This is indicated by the first red LED, mark "0". For best performance operate the console with the meters averaging "0" or just below, with occassional peaks into the "red".







L-R MASTER and TALKBACK BLOCK DIAGRAM



TB LEV Adjusts the sensitivity of the internal talkback microphone.

TALK to GRPS This momentary action switch lets you talk to the eight groups simultaneously, useful for recording track identification and other session details on the tracks of your multitrack, sometimes referred to as "slate".

TALK to CUE This momentary action switch lets you talk to the stereo CUE output which would normally be connected to your studio or musicians foldback system. The talkback signal mixes with the cue programme so that your musicians may still hear their foldback mix while you talk to them. The talk signal does not appear at the individual CHANNEL CUE and MONITOR CUE output sockets.

L-R MASTER FADER/S Depending on the console version, one or two long throw faders for left and right let you control the overall level of your stereo mix.

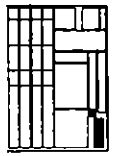
You may use these to fade in or out the mix, or to adjust the stereo balance. The normal operating position (unity gain) is mark "0", with a further 10dB of boost available at maximum.

HEADPHONES The headphone socket is positioned on the right of the master section underneath the armrest so that the cable does not interfere with the panel controls. We recommend that you use professional quality stereo headphones of 8 to 600 ohms impedance.

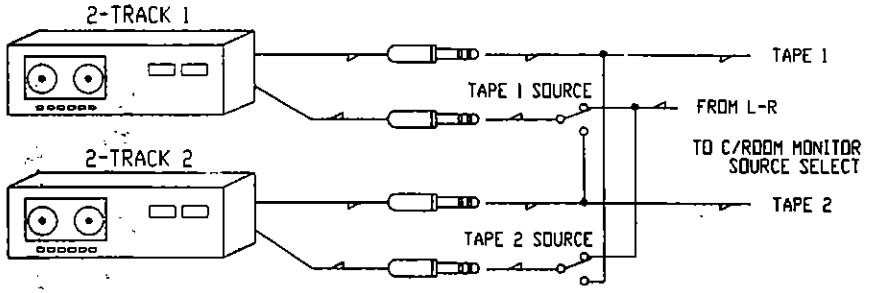
Refer to the diagram on the following page.

L-R MASTER FADERS, TALKBACK and HEADPHONES

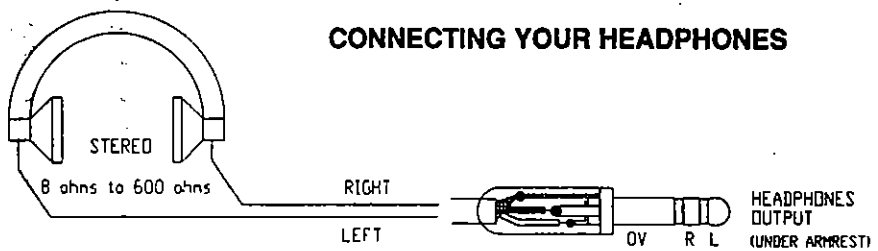
The built in talkback system lets you record track information on your multitrack, and talk to your studio or musicians foldback.



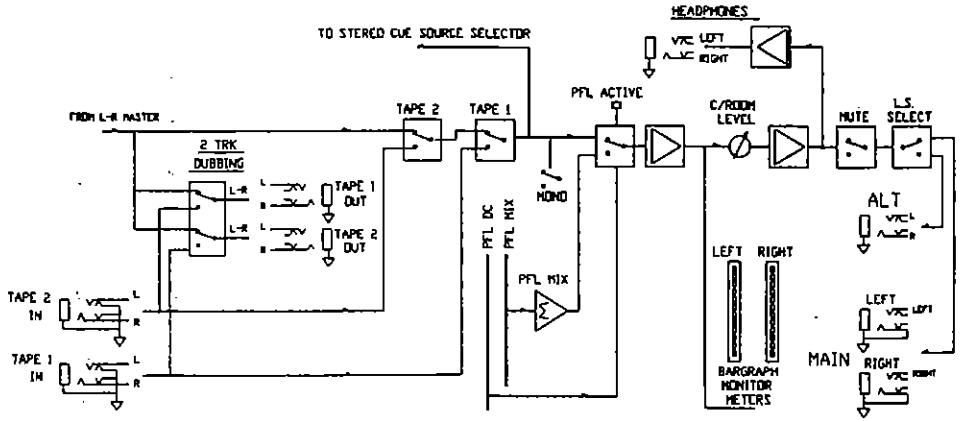
DUBBING BETWEEN TWO 2-TRACK RECORDERS

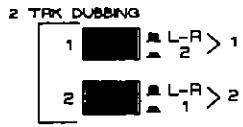


CONNECTING YOUR HEADPHONES



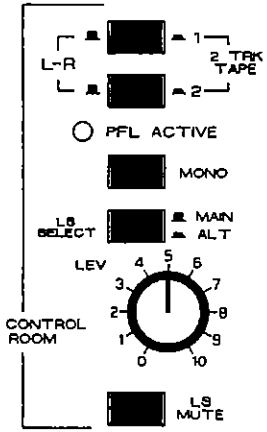
CONTROL ROOM MONITOR BLOCK DIAGRAM





2-TRACK DUBBING One switch for each of your 2-track mastering recorders selects its recording source. In the normal (up) position the console L-R output (stereo mix) is selected . When pressed, the output of the other becomes the source. This allows you to record from one machine to the other (known as "dubbing") without having to replug the cables.

CONTROL ROOM SOURCE SELECT Two switches let you monitor the playback from either of your 2-track recorders. With both switches released (up) the console L-R stereo mix output becomes the source. If you press both switches then 2-trk 1 takes priority over 2-trk 2. The selected source may also feed your stereo cue system by pressing the FOLLOW C/ROOM switch in the STEREO CUE section. This enables playback to your musicians foldback.



PFL ACTIVE This red LED lights when you press a PFL or AFL switch anywhere on your console. Your monitor loudspeakers, headphones and L-R meters automatically switch to the PFL source which is fed in mono to both sides. Note that you may mix the PFL signals by pressing more than one switch. When you release PFL the active LED turns off and the selected monitor source is restored.

MONO Combines the left and right monitor programme, useful for checking mono compatability. This does not affect the feed to the stereo CUE source selector.

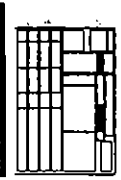
LS SELECT Switches between your main (reference) and alternate (domestic) monitor systems for signal comparison.

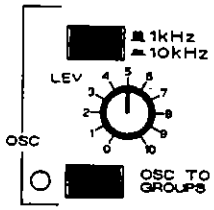
LEV Controls the level of the monitor outputs.

LS MUTE Switches off (mutes) the output of your console to your loudspeaker monitor systems so that you may use headphones only, or quickly quieten the output. We recommend that you use this switch to protect your loudspeakers whenever you turn your console on or off.

MASTER SECTION - CONTROL ROOM MONITOR

Provides comprehensive audio and meter monitoring of your programme at many points in the console audio path, and your 2-track playback. Connects to 2 speaker systems and headphones.





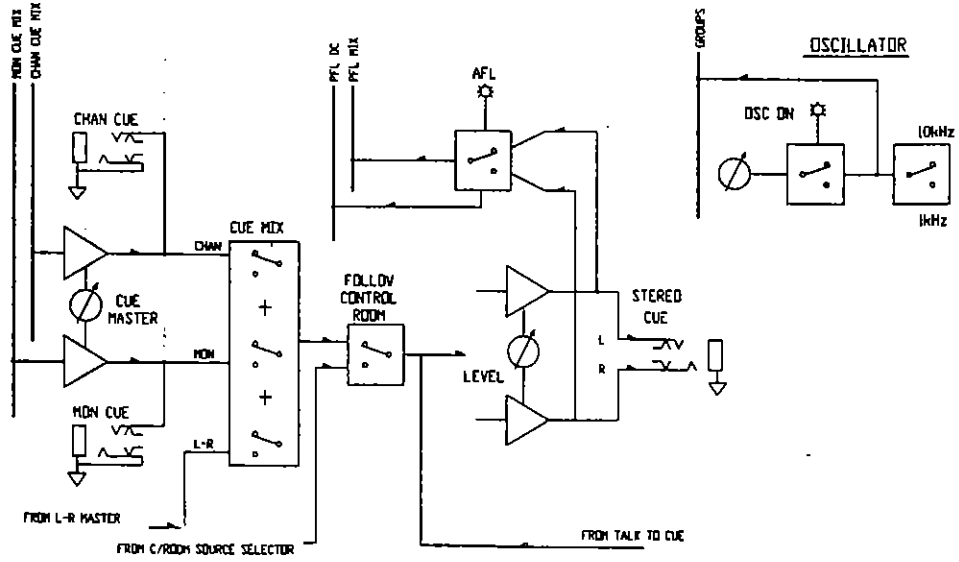
1kHz / 10kHz In the normal (up) position the internal oscillator generates a sinewave tone at a frequency of 1kHz. When pressed a 10kHz tone is generated. These tones are used for checking the level matching between your console and studio equipment, or to check the line-up of your tape machines.

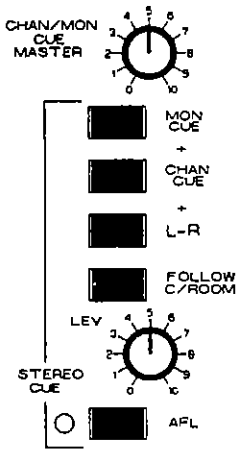
LEV Adjusts the output level of the oscillator.

OSC TO GROUPS When selected this switch turns on the internal oscillator and routes the tone to the eight groups. The output is available at the channel GRP/DIR sockets, ie. to your multitrack. Alternatively you may patch the tone from a group insert send to test other signal paths in your system. Always switch the oscillator off when recording with your console.

Refer to the section **Getting Started** for details on how to use the oscillator to check your multitrack line-up.

OSCILLATOR and CUE BLOCK DIAGRAM





CHAN/MON CUE MASTER Adjusts the overall level of both the CHANNEL CUE and MONITOR CUE mix outputs simultaneously. Normal operating position is mark "7" when feeding the STEREO CUE system.

STEREO CUE SOURCE SELECTORS Switches a combination of sources to feed the STEREO CUE output . MON CUE and CHAN CUE (in mono), and the stereo L-R signal may be mixed in any combination.

This allows for a very flexible approach to setting up cue mixes during recording and overdubbing. You can set up a dedicated mix using the channel cue sends, or for a quick cue mix you could start with the main L-R mix and then raise the level of a specific channel by using the related cue send.

FOLLOW C/ROOM Selects the control room monitor source as the source to the STEREO CUE system allowing you to replay your stereo recordings into your studio or musicians foldback headphones. This feed is not affected by the control room MONO switch, or by the PFL system.

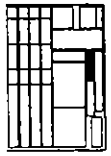
You may talk to the STEREO CUE output using the built in talkback microphone. The talk signal is mixed with the cue programme.

LEV Controls the STEREO CUE output level. Normal operating position should be around mark "7".

AFL (after-fade-listen) Allows the post cue level signal to be checked through the control room monitors without interrupting the recorded programme.

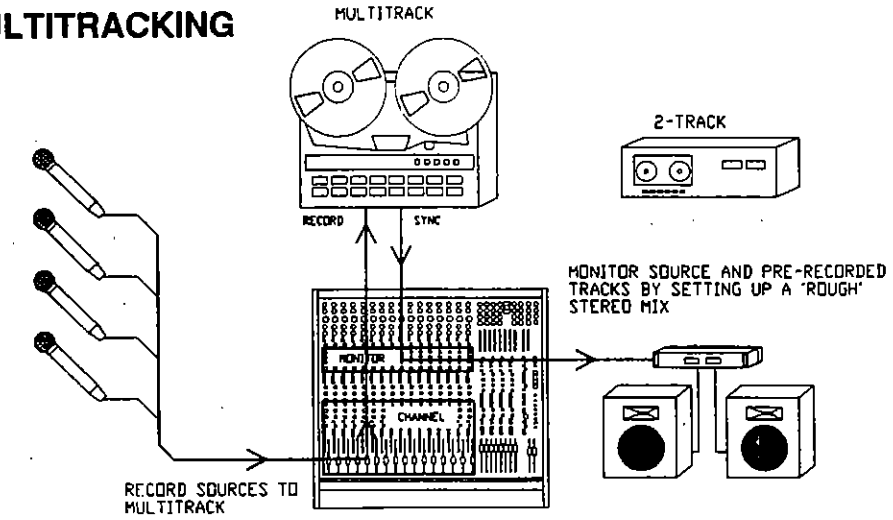
MASTER SECTION - OSCILLATOR and CUE

An internal oscillator lets you to check and line up your system. The CUE section offers flexible control over the programme you send to your studio or musicians foldback system.

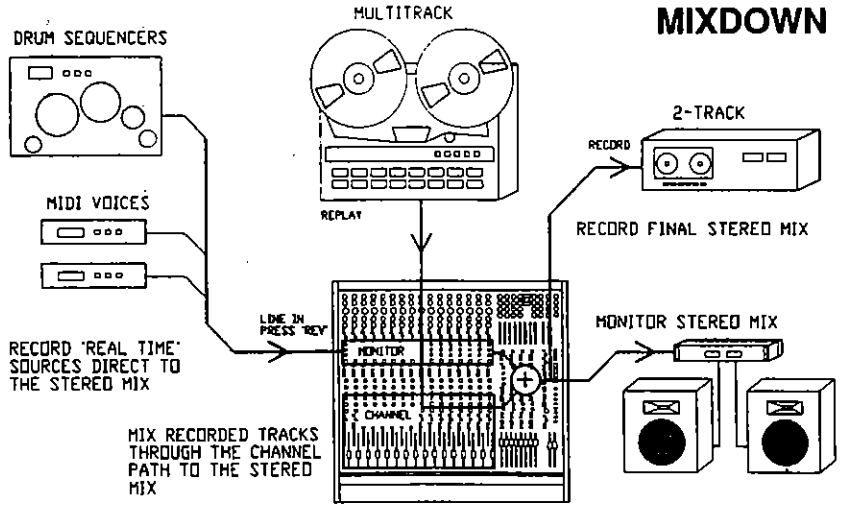


These diagrams illustrate the basic recording stages as described in the following section.

MULTITRACKING



MIXDOWN



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ABOUT MUTE AUTOMATION

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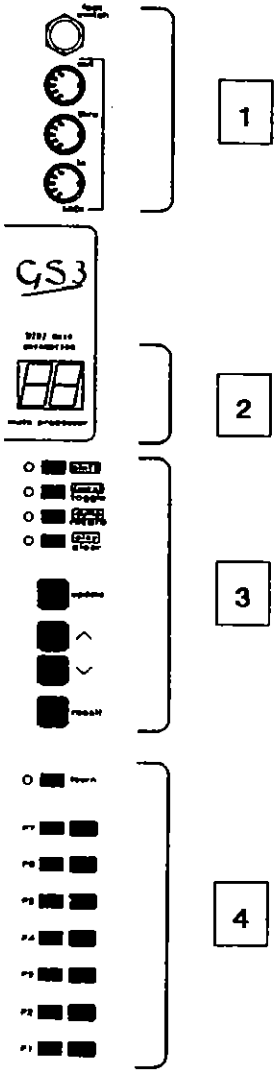


Your console features the powerful *ALLEN & HEATH* **V4** ***plus*** mute automation system. This is the most advanced release of the market leading MIDI mute automation system fitted to consoles costing many times the price.

The power of this system is such that it demands a complete reference manual of its own to present the full potential. Please make time to read PART B of this manual which is dedicated to this system. This describes the full control function, the background and implementation of MIDI, and opens the door to many of the creative recording possibilities.

In this section we present a general overview of the system and its basic operation to help you identify the controls and get started.

THE CONTROL LAYOUT:

1 THE CONNECTORS Three standard MIDI (musical instrument digital interface) connectors allow you to interface your console to other MIDI equipment in your system. You may plug in a footswitch for "hands off" control.

2. THE DISPLAY This 2 digit LED display gives you easy visual indication of system status.

3. THE CONTROL KEYS You use these keys to program and recall your mute patches, control the internal sequencer, set up MIDI, and access the more advanced functions.

4. THE LEARN KEYS Seven function keys (one linked to the footswitch) may be user programmed for MIDI commands and patch recall.

GENERAL OVERVIEW

Your console has a built in microcomputer which controls the mutes (switching on and off) of the CHANNEL and MONITOR signal paths, FX send outputs, and stereo FX returns, thus allowing advanced static and real-time automation of these mute changes.

Your console is ready to use in the normal way as soon as you switch it on. You may toggle your mutes on or off manually without needing to access the control keypad and without connecting to external MIDI equipment.

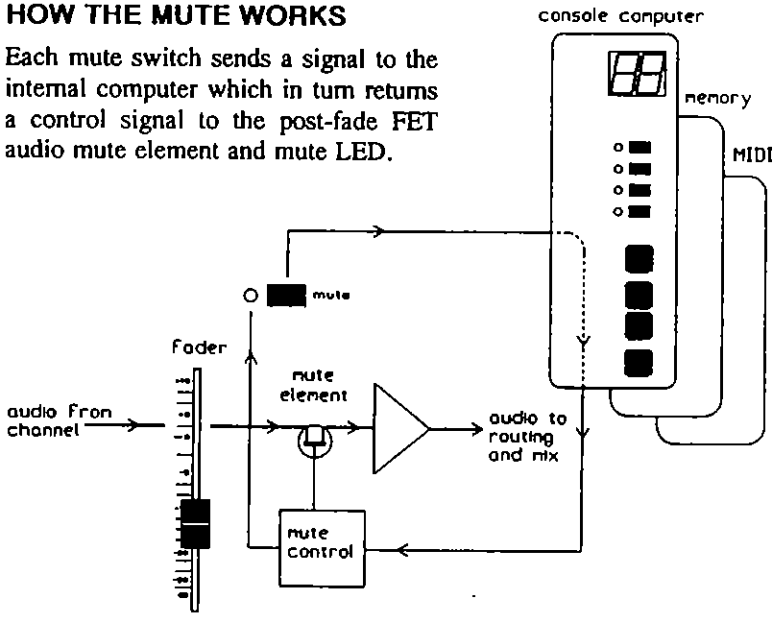
Static automation lets you program and recall up to 32 "snap-shot" MUTE PATCHES which are retained in the battery backed console memory. These may be archived, recalled, or linked to the patch settings of your other equipment via MIDI.

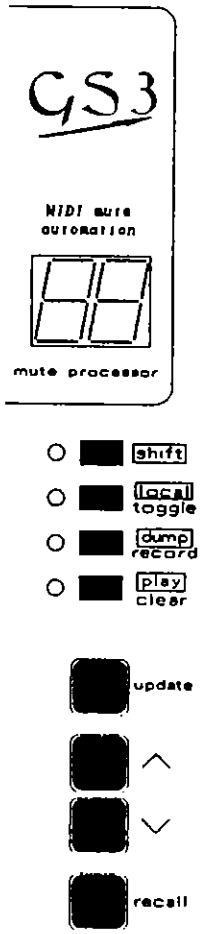
Real-time automation lets you record your real-time mute changes in sync with your system MIDI CLOCK. These are stored in the internal song memories. You may carry out off-line editing and archiving of this data, and have the muting operations synchronised to your multitrack.

You have seven LEARN KEYS and a footswitch which you may program with MIDI command sequences such as "stop" and "start", or recall selected patches. A useful PATCH SOLO function may be set up.

HOW THE MUTE WORKS

Each mute switch sends a signal to the internal computer which in turn returns a control signal to the post-fade FET audio mute element and mute LED.





THE DISPLAY This easy to read 2-digit red LED display shows the system status as decribed below:

SHIFT KEY You use this to select the "shifted" function of the other keys, indicated by the rectangular boxes, or to change the keypad operating mode. The LED indicates the selected keypad mode.

There are four basic keypad operating modes :

NORMAL MODE:	shift LED off
SHIFT MODE:	shift LED on (steady state)
SONG MODE:	shift LED flashing (slow)
CONSOLE MODE:	shift LED flashing (fast)

The 2-digit display shows different information for each mode:

NORMAL MODE:	selected patch number
SHIFT MODE:	current system MIDI channel
SONG MODE:	Selected song number
CONSOLE MODE:	Current mode number

The shift key steps through the first three of these modes in a cyclic fashion, ie. after SONG MODE the system returns to NORMAL MODE.

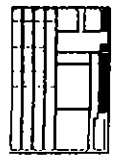
CONSOLE MODE may be selected at any time by pressing and holding down the shift key. The display scrolls slowly through modes 1 to 8. You release shift when the display reaches the mode number you require.

CONSOLE MODE sets the form of the MIDI implementation, and whether or not the display and memory are AUTO INCREMENTED after a patch recall or update:

In SHIFT mode the display shows the selected **MIDI CHANNEL** number, default = 16. You may change this using the up and down keys.

CONSOLE MODES

MODE 1:	Increment ON	Mutes as NOTE ON / OFF
MODE 2:	OFF	NOTE ON / OFF
MODE 3:	ON	CONTROLLER CODES
MODE 4:	OFF	CONTROLLER CODES
MODE 5:	ON	No MIDI channel voice messages
MODE 6:	OFF	No MIDI channel voice messages
MODE 7 and 8	refer to PART B of this manual.	



TOGGLE / LOCAL KEY and LED

Selects TOGGLE MODE, with LED on. The display normally shows the current patch/song memory for RECALL or UPDATE. In TOGGLE MODE the display shows the patch/song which was last recalled, useful after an automated RECALL .

In SHIFT mode the LED indicates the MIDI LOCAL MODE, on or off. Press the key to toggle the state.

RECORD / DUMP KEY and LED

Starts the recording of the mute events in sync with MIDI CLOCK using the internal sequencer.

With SHIFT mode selected you may DUMP various selections of patch data to archive to an external sequencer or librarian system. In SONG mode you may archive song data.

CLEAR / PLAY KEY and LED

Pressing the CLEAR key initiates a sequence of events to erase or reset a patch, song or specific function. This is normally a double-press operation with a flashing LED to protect the data should you press the key by mistake.

In SONG mode PLAY is used to enable playback of the sequencer.

In SHIFT mode you may isolate selected channels from the internal mute automation system for playback, recording and patch recalls. The channel mute LEDs show which channels have been isolated.

UPDATE This large key is used to update the contents of the current mute patch, song memory, or MIDI channel selection. Depending on the CONSOLE MODE the patch display number may be auto incremented following this.

UP (INCREMENT) Pressing this key increments the number in the display. Holding the key down for a second or so causes it to scroll up, useful for getting to a particular number quickly. The display wraps around at number 32 back to 0 for patches, 32 to 1 for songs, and 16 to 1 for MIDI channel.

DOWN (DECREMENT) Pressing this key decrements the display as above.

RECALL This large key is used to update your console with the contents of a patch or song memory. Depending on the CONSOLE MODE the display may be auto incremented following this. It is also used to select the format for patch dumps.

For full details please refer to PART B of this manual.

WHEN YOU SWITCH YOUR CONSOLE ON

On power up the display should settle at "0" indicating that the console mutes have been reset to PATCH 0. The channel mute LEDs will display the PATCH 0 mute status. The normal setting (factory default) is all mutes off.

If the display shows a flashing "0", is blank, or shows some other non zero display, then an error condition is indicated. For further details please refer to PART B of this manual.

All LEDs on the Mute Processor keypad should be off, ie. the system is in its NORMAL operating mode.

BATTERY BACKED RAM Your console has a built in battery backed memory system which retains your patch and song data, and other important console settings when power is removed. The battery is automatically recharged while your console is turned on so that you should not normally need to replace it.

The standard factory settings are referred to as the DEFAULTS. You may of course change these to suit your specific requirements. Your changes will be remembered when power is removed so that you do not need to reset these each time you switch your console on.

In the unlikely event of the Mute Automation System becoming totally confused you may reset your console to these defaults. This procedure is described fully in PART B.

THE DEFAULT SETTINGS (RESET)

CONSOLE MODE = 5 (increment ON, no MIDI voice messages)

MIDI channel = 16

MIDI local mode = ON

PATCH 0 = all mutes off (mute LEDs off)

PATCH 1 to 32 = as last set

Current Song number invalid

LEARN KEYS - see table later in this section

GETTING STARTED WITH MUTE AUTOMATION

Your console is ready for use right away. You may toggle the channel and FX mutes on and off as required without further keypad action.

A good starting point is to learn to use the internal patch memories to store and recall the console mute settings.

At any time the console mute settings may be stored in one of 33 patch memories. You normally reserve PATCH 0 for the power up and start of song mute pattern you require, default = all mutes off. This leaves patches 1 to 32 available for general use. A MUTE PATCH is a "snap-shot" of the console mute settings.

UPDATE A MUTE PATCH

Set the console mutes as you require.

Use the UP and DOWN keys to select the PATCH number you wish to update.

Press the UPDATE key on the Mute Processor keypad. Depending on the CONSOLE MODE the display may auto increment to the next number up (or wrap around to zero).

This operation overwrites any previous snap-shot in the selected patch number.

RECALL A PATCH

Use the UP and DOWN keys to select the PATCH number that holds the mute settings you wish to recall.

Press the RECALL key. The status of the console mutes is instantly changed. Depending on the CONSOLE MODE the display may auto increment to the next patch number.

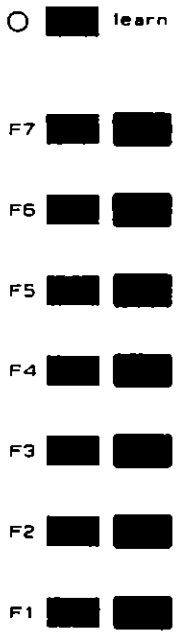
CLEARING PATCHES

You may clear the contents of a mute patch by first resetting the console mutes to off, and then updating the patch numbers you wish to clear.

To reset the mutes press the CLEAR key. The CLEAR LED should light. Press CLEAR again. The CLEAR LED and all console mutes should turn off.

To realise the full potential of your V4 *plus* Mute Automation System please read PART B of this manual.

THE LEARN (FUNCTION) KEYS



FOOTSWITCH You may plug in a standard momentary action footswitch to use as a function key. This is linked to the F7 key. You may use either the footswitch or the F7 key to program or activate the function.

LEARN This momentary action key is used when programming the function keys. The LED indicates the learn status:

ON = waiting for function key number
SLOW FLASH = learning "pressed" commands
FAST FLASH = learning "release" commands

Refer to PART B for full details.

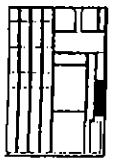
F1 to F7 You may program these seven function keys either to output MIDI messages of your choice, or to recall internal mute patches.

Write-on boxes let you identify your commonly used functions using chinagraph pencil or similar.

DEFAULT (RESET) SETTINGS:

F7	MIDI	pressed = RECORD	note on/off C 6 & A5	f/switch
F6	MIDI	pressed = STOP	note on/off C6 & B5	
F5	MIDI	pressed = PLAY	note on/off C6 & A#5	
F4	MIDI	pressed = F/FORWARD	note on C6 & G#5	
		release = "	note off G#5 & C6	
F3	MIDI	pressed = REWIND	note on C6 & G5	
		release = "	note off G5 & C6	
F2	32	pressed = PATCH 32	recall	
F1	31	pressed = PATCH 31	recall	

Unless shown above the release function is not applicable.
These functions are remembered when power is removed.



PATCH SOLO

You may use the learn key facility to set up a useful PATCH SOLO function.

SOLO lets you listen to a selected signal by muting all the other signals in the mix, most useful in setting up your mix as you may hear its contribution at the correct level and position within the stereo image.

The default setting for F1 is PATCH 31 recall, and F2 is PATCH 32 recall. Update PATCH 32 to be all channels muted. Update PATCH 31 before you carry out solo to the current console mute settings.

To carry out SOLO first press the F2 key. This mutes all signals. Immediately press the MUTE key of the signal you wish to solo. This turns that mute off and lets you hear just the wanted signal.

To restore your previous mute setting simply press the F1 key.

SOLO SAFE

A channel is said to be SOLO SAFE if it is not muted when solo is selected. This is normal for effects returns such as reverb where you want to hear both the "dry" and "wet" (processed) contribution of your selected solo channel.

To make a channel solo safe simply turn its mute off in the "solo" PATCH 32. Now when you press F2 to carry out solo that channel will not be muted.

LEVEL / EQUALISER SWITCHING

You may have a situation where you wish to bring an instrument forward such as a guitar playing backing during most of a song and lead for part. You could do this by feeding the signal to two channels and adjusting the fader and equaliser accordingly, perhaps a bit louder and brighter (mid EQ boost) for the "lead" channel. Mute one of these channels and toggle the mutes during the song accordingly.

THE AUTOMATED MIX

The greatest power of the system is realised by syncronising your mute changes to your multitrack or studio MIDI system so that they are "played back" automatically during mixdown.

Apart from freeing your hands for more creative tasks, this offers other important benefits such as "cleaning" your tracks of unwanted noise such as coughs, squeaks and thumps, "gating" in your instruments and effects devices only when you need them to reduce source noise, "splitting" your tracks and input channels to optimise track useage and to create automated effects, and switching between different track "takes" during mixdown.

All this may be recorded in "real-time" using the built in sequencer or your studio MIDI sequencer or keyboard. You may carry out precice editing of the mutes using the built in editing facility, or using an external sequencer/editor package (known as "off-line" editing).

THE MIDI MAP (TRANSLATION TABLE)

Your console is "mapped" on to the middle octaves of a standard MIDI keyboard. This links each console mute switch to a specific MIDI note number, thus letting you "play" the mutes from your MIDI keyboard and edit them on your off-line editor as musical notes.

You will find the CONSOLE CHANNEL TO MIDI NOTE NUMBER TRANSLATION TABLE for your console in the *QUICK REFERENCE* section in PART B of this manual.

Many creative possibilities are opened up by using your consoles mute automation. We recommend that you take some time to learn and experiment with the system to achieve the best for your needs. Please read PART B of this manual as it presents an in-depth look at the basic principles and advanced use of both the manual and automated features of this system.

QUICK REFERENCE FOR GS3 MUTE AUTOMATION

Nm=NORMAL MODE, Sh=SHIFT MODE, Sg=SONG MODE, Cn=CONSOLE MODE
$=TAPE MUST BE STOPPED, [..] OPTIONAL, RQST=MIDI REQUEST OPTION

FUNCTION	MODE	OPERATION	COMMENT	MIDI
		MUTES & PATCHES		
MIDI CHANNEL NUMBER	Sh	Change Number Press UPDATE	(flashes) (steady)	- -
MIDI LOCAL MODE (TEMP)	Sh	Press LOCAL	LED on = Local on	-
MIDI LOCAL MODE (PERMANENT)	Sh	Press & Hold LOCAL Press UPDATE	LED on = Local on	-
MUTE KEY (1)	-			NOTE ON/OFF (Cn 1&2[7&8])
MUTE KEY (2)	-			CONTROLLER CODE (Cn 3&4[8])
CLEAR CONSOLE MUTES	Nm	CLEAR Key-twice	LED - on then off	-
UPDATE PATCH	Nm	Select Number Press UPDATE		-
RECALL PATCH	Nm	Select number Press RECALL		PROGRAM CHANGE (Cn 1-4,7&8)
TOGGLE PATCH	Nm	Press TOGGLE	LED = on = TOGGLE on	-
DUMP PATCH MEMORY	Nm Sh	Select Number->[Nm] Press DUMP	LED will blink	SYSEX DUMP (Cn-ALL)+RQST
DUMP VIRTUAL PATCH	[Nm] Sh Sh	[Select number->] Press RECALL Press DUMP	LED = Slow flash LED = off	SYSEX DUMP (Cn-ALL)
DUMP ALL PATCHES	Sh	Press RECALL twice	LED = Fast flash	SYSEX DUMP (Cn-ALL)+RQST
		SONGS		
RECORD SONG	Nm	Press RECORD	LED on = RECORD on LED flashes if tape stopped	-
PLAYBACK SONG	Sh	Press PLAY	LED on = PLAYBACK on (Patch 0 recalled on tape start)	-
SAVE SONG to MEMORY($)	Sg	Select number Press UPDATE	Display flash = No data Display will blink	-
LOAD SONG from MEMORY($)	Sg	Select number Press RECALL twice	Display flash = No data Display will blink	SONG SELECT (Cn-ALL)
ARCHIVE SONG($)	Sg	Select Number Press DUMP	Display flash = No data LED will blink	SYSEX DUMP (Cn-ALL)+RQST
RETRIEVE SONG ($)	Any	-	(See error displays)	SYSEX DUMP (Cn-ALL)
TOGGLE SONG	Sg	Press TOGGLE	LED on = TOGGLE on	-

		EDITING		
UNDO ERASE	Nm	Omit '*' lines	Various	-
ERASE LAST MUTE	Nm	Start tape Press RECORD Press CLEAR Press MUTE key Press CLEAR (*) Press RECORD	 LED on = Record on LED will flash Mute erased LED off LED off	-
ERASE FORWARD	Nm	Start tape Press RECORD Press & hold CLEAR Press & hold MUTE key Release MUTE key Release CLEAR Press CLEAR (*) Press RECORD	 LED = Record on LED will flash (no state change) Mutes(s) erased LED stays flashing LED off LED off	-
ERASE CHANNEL ($)	Nm	Press RECORD Press & hold CLEAR Press MUTE key Release CLEAR Press CLEAR (*) Press RECORD	LED flash LED flash (no state change) LED stays flashing LED off LED off	-
ERASE PATCH RECALL EVENT (1)	Nm	Select number Start tape Press RECORD Press CLEAR (wait for patch to pass) Press RECALL Press CLEAR (*) Press RECORD Stop tape	 LED on LED flash LED off LED off	-
ERASE PATCH RECALL EVENT (2)	Nm	Press TOGGLE Start tape Press RECORD Press CLEAR (wait for patch to pass) Press RECALL Press CLEAR (*) Press RECORD Press TOGGLE Stop tape	LED on LED on LED flash - in display - LED off LED off LED off	-
ERASE SONG WORKING MEMORY ($)	Sg	Press CLEAR twice	LED on then off	-
UNDO THE ABOVE($)	Sg	Press CLEAR twice	LED On then off (tape must not have been moved)	-
ERASE SONG MEMORY ($)	Sg	Select Number Press & Hold CLEAR Press UPDATE	flash = no data present LED on Clear LED off - Display flashes	-

MISCELLANEOUS

CHANNEL ISOLATE (S)	Sh	Press & hold PLAY Press MUTE key(s) Release PLAY	LED flashes MUTE on = isolated
RESET CONSOLE	-	Power OFF Hold CLEAR key Power ON Press CLEAR key	LED off
ACCESS CONSOLE MODES	-	Press & hold SHIFT Hold until number wraps to correct preference Release SHIFT	LED quick flash Previous mode restored
LEARN FUNCTION KEY	Nn	[Select patch number] Press LEARN Press FKEY Press CLEAR [Tx MIDI] [Press RECALL] Press FKEY [Tx MIDI] [Press RECALL] Press FKEY	 LED on Clear LED slow flash (Display = FKEY number) Clear LED off, Learn LED slow flash Learn LED fast flash Learn LED off (Display returns to normal)

NOTES FOR THE CONSOLE CHANNEL TO MIDI NOTE NUMBER TRANSLATION TABLE

(see overleaf)

KEY:
- A STEINBERG PRO 24
- B AKAI, YAMAHA, KORG, CUBASE, C-LAB EQUIPMENT
- C ROLAND EQUIPMENT
- CH CONSOLE CHANNEL PATH
- MON CONSOLE MONITOR PATH
- SR CONSOLE STEREO RETURN
- FX CONSOLE FX SEND

NOTE: CONTROLLER CODE CHANNEL NUMBERS REMAIN THE SAME

CONSOLE CHANNEL TO MIDI NOTE NUMBER TRANSLATION TABLE (GS3 CONSOLES WITH v4.1 SOFTWARE)

HEX	DEC	CH	MON	A	B	C
0	0					C 3
1	1					C#3
2	2					D 3
3	3					D#3
4	4					E 3
5	5					F 3
6	6					F#3
7	7					G 3
8	8					G#3
9	9					A 3
A	10					A#3
B	11					B 3
C	12					C 0
D	13					C#0
E	14					D 0
F	15					D#0
10	16					E 0
11	17					F 0
12	18					F#0
13	19					G 0
14	20					G#0
15	21					A 0
16	22					A#0
17	23					B 0
18	24	SR1				C 1
19	25	FX1				C#1
1A	26	SR2				D 1
1B	27	FX2				D#1
1C	28	SR3				E 1
1D	29	FX3				F 1
1E	30	SR4				F#1
1F	31	FX4				G 1

HEX	DEC	ICH	MON	A	B	C
20	32	1		G#1	G#0	G#1
21	33		1	A 1	A 0	A 1
22	34	2		A#1	A#0	A#1
23	35		2	B 1	B 0	B 1
24	36	3		C 0	C 1	C 2
25	37		3	C#0	C#1	C#2
26	38	4		D 0	D 1	D 2
27	39		4	D#0	D#1	D#2
28	40	5		E 0	E 1	E 2
29	41		5	F 0	F 1	F 2
2A	42	6		F#0	F#1	F#2
2B	43		6	G 0	G 1	G 2
2C	44	7		G#0	G#1	G#2
2D	45		7	A 0	A 1	A 2
2E	46	8		A#0	A#1	A#2
2F	47		8	B 0	B 1	B 2
30	48	9		C 0	C 2	C 3
31	49		9	C#0	C#2	C#3
32	50	10		D 0	D 2	D 3
33	51		10	D#0	D#2	D#3
34	52	11		E 0	E 2	E 3
35	53		11	F 0	F 2	F 3
36	54	12		F#0	F#2	F#3
37	55		12	G 0	G 2	G 3
38	56	13		G#0	G#2	G#3
39	57		13	A 0	A 2	A 3
3A	58	14		A#0	A#2	A#3
3B	59		14	B 0	B 2	B 3
3C	60	15		C 1	C 3	C 4
3D	61		15	C#1	C#3	C#4
3E	62	16		D 1	D 3	D 4
3F	63		16	D#1	D#3	D#4

HEX	DEC	CH	MON	A	B	C
40	64	17		E 1	E 3	E 4
41	65		17	F 1	F 3	F 4
42	66	18		F#1	F#3	F#4
43	67		18	G 1	G 3	G 4
44	68	19		G#1	G#3	G#4
45	69		19	A 1	A 3	A 4
46	70	20		A#1	A#3	A#4
47	71		20	B 1	B 3	B 4
48	72	21		C 2	C 4	C 5
49	73		21	C#2	C#4	C#5
4A	74	22		D 2	D 4	D 5
4B	75		22	D#2	D#4	D#5
4C	76	23		E 2	E 4	E 5
4D	77		23	F 2	F 4	F 5
4E	78	24		F#2	F#4	F#5
4F	79		24	G 2	G 4	G 5
50	80	25		G#2	G#4	G#5
51	81		25	A 2	A 4	A 5
52	82	26		A#2	A#4	A#5
53	83		26	B 2	B 4	B 5
54	84	27		C 3	C 5	C 6
55	85		27	C#3	C#5	C#6
56	86	28		D 3	D 5	D 6
57	87		28	D#3	D#5	D#6
58	88	29		E 3	E 5	E 6
59	89		29	F 3	F 5	F 6
5A	90	30		F#3	F#5	F#6
5B	91		30	G 3	G 5	G 6
5C	92	31		G#3	G#5	G#6
5D	93		31	A 3	A 5	A 6
5E	94	32		A#3	A#5	A#6
5F	95		32	B 3	B 5	B 6

HEX	DEC	CH	MON	A	B	C
60	96			C 4	C 6	C 7
61	97			C#4	C#6	C#7
62	98			D 4	D 6	D 7
63	99			D#4	D#6	D#7
64	100			E 4	E 6	E 7
65	101			F 4	F 6	F 7
66	102			F#4	F#6	F#7
67	103			G 4	G 6	G 7
68	104			G#4	G#6	G#7
69	105			A 4	A 6	A 7
6A	106			A#4	A#6	A#7
6B	107			B 4	B 6	B 7
6C	108			C 5	C 7	C 8
6D	109			C#5	C#7	C#8
6E	110			D 5	D 7	D#8
6F	111			D#5	D#7	D#8
70	112			E 5	E 7	E 8
71	113			F 5	F 7	F 8
72	114			F#5	F#7	F#8
73	115			G 5	G 7	G 8
74	116			G#5	G#7	G#8
75	117			A 5	A 7	A 8
76	118			A#5	A#7	A#8
77	119			B 5	B 7	B 8
78	120			C 6	C 8	C 9
79	121			C#6	C#8	C#9
7A	122			D 6	D 8	D 9
7B	123			D#6	D#8	D#9
7C	124			E 6	E 8	E 9
7D	125			F 6	F 8	F 9
7E	126			F#6	F#8	F#9
7F	127			G 6	G 8	G 9

INTRODUCTION

This is the AUTOMATION SYSTEMS OWNER MANUAL for the GS3V audio mixing console. The operation of the mute and VCA fader automation is described with easy to follow diagrams and explanatory text.

Before using your automation please read the **Getting Started** section. This will introduce you to the system and take you through a step-by-step procedure of creating an automated mix. The rest of the manual can be used as a reference which you can use to get more in-depth descriptions of the automation functions. We also recommend that you first become familiar with the layout and function of your console by reading the GS3 AUDIO SYSTEMS OWNER MANUAL.

The GS3V is accompanied by a 3.5" floppy disk for Allen & Heath's V-EDIT control & display program for the Atari ST computer. Although you do not need an external computer to control the console automation functions, we recommend that you start with V-EDIT as it gives you a comprehensive graphical display and on-line HELP screens to help you learn the system quickly.

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INITIAL SYSTEM CHECK

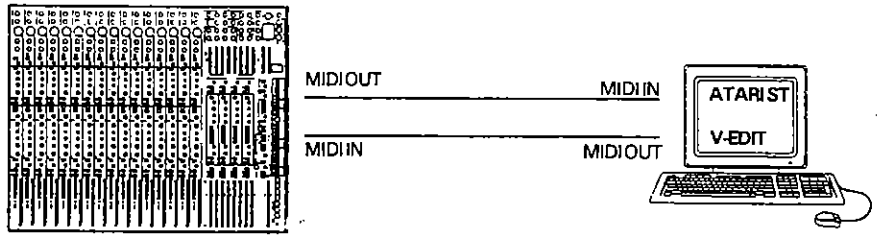
First check that you have installed the console and power unit according to the instructions in the **Getting Started** section of the GS3 AUDIO SYSTEMS OWNER MANUAL. Carry out the POWER UP CHECK as described in that manual.

ON POWER-UP

You may notice that several of the automation system LED indicators flash briefly as the system settles and carries out its power-up self test. The MIDI Rx/Tx LED (above the L-R fader) flashes as it transmits an initialising MIDI message for external equipment. Once settled the display should read a steady 0 and the PATCH, VCA and MUTE LEDs, on the control strip, will be turned on. Your console is now ready in PATCH MODE with PATCH ZERO selected (first of the 33 internal snapshot memories). The console MUTE switches and FADERS may be operated immediately as on a conventional non-automated console.

V-EDIT

This program is ideal for learning the GS3V automation, providing a graphical display of the console fader positions, VCA levels, mute switch settings, group assignment, automation status and SMPTE readout. To use V-EDIT you need an Atari computer (ST 1040, Mega 1/2/4 running TOS V1.2 or later), a monochrome monitor, and two MIDI leads. Connect the system as shown below. Power up the console, insert the V-EDIT disk in the Atari, and then load the program by double clicking on the GS3V.PRG icon. For more information on V-EDIT see section 8.

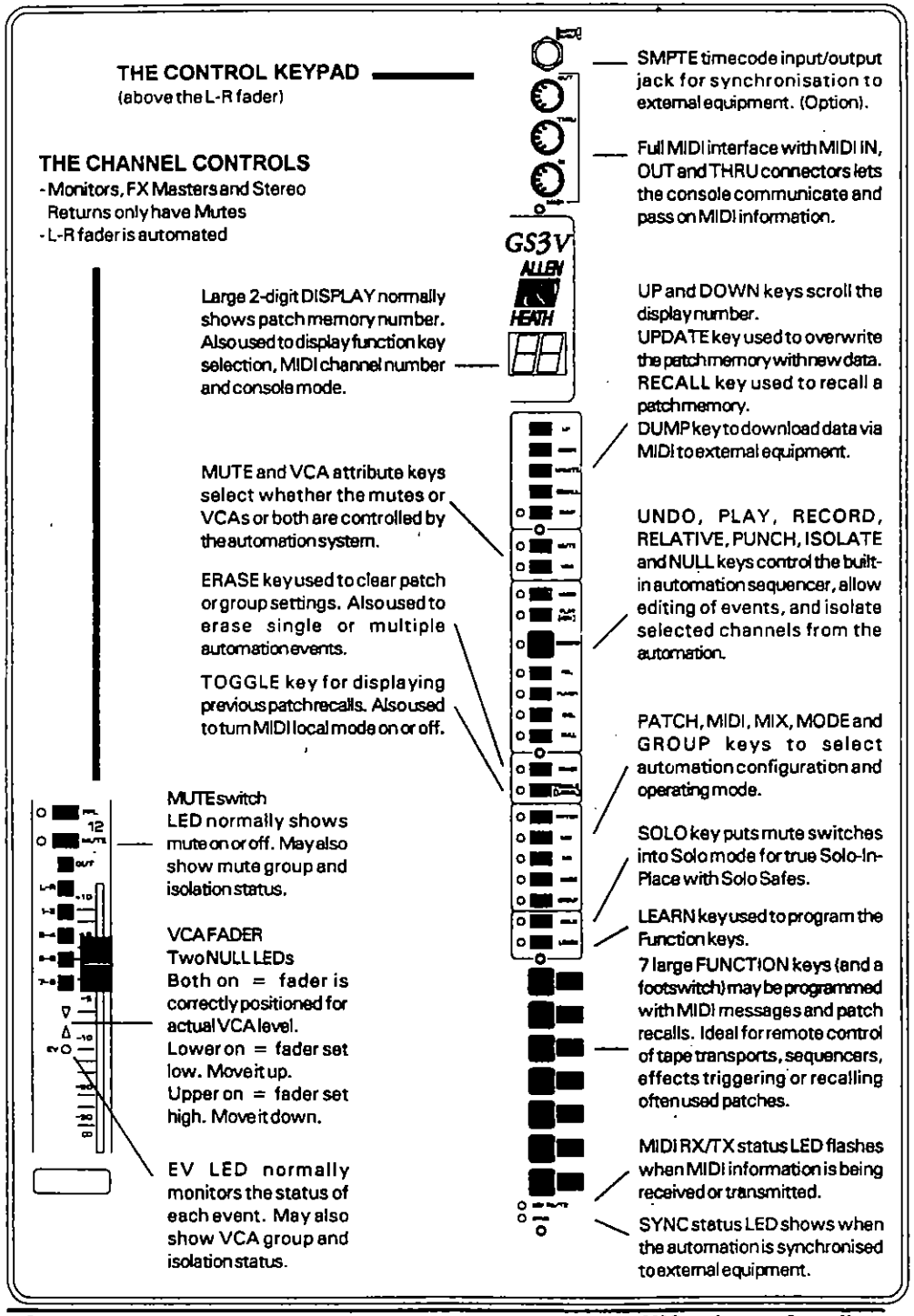


GS3V AUTOMATION EXPLAINED

The Channels, Monitors, four FX Masters and four Stereo Returns each have an automated momentary MUTE switch. When pressed this sends a control signal to the automation computer which returns information to an FET gate circuit to toggle the audio signal on or off. A red LED indicator alongside shows mute status (on = signal muted) or mute group assignment.

Unlike conventional consoles which pass audio directly through the faders, each GS3V channel FADER and the L-R fader sends a DC control voltage, proportional to its position, to the automation computer. This returns a related DC voltage to a VCA (voltage controlled amplifier) to control the audio level. As the fader position and VCA level may not always be the same, two triangular LEDs next to each fader indicate the NULL point. Both lit indicate the same point - NULLED. Only the lower LED lit indicates that the fader is lower than the VCA level; the top LED indicates that it's higher. The EV LED indicates automation events, and other important status information.

The internal automation computer enable you to save and recall mute and fader settings in the internal patch memories, automate your mix by recording and replaying mute and fader changes (using the built-in real time sequencer), communicate data between the console and other equipment in your system using MIDI ... and much more.



TUTORIAL - RECORDING YOU FIRST MIX

This section will give you a quick guided tour of the automation system by performing an automated mix. The steps you will carry out are:

- Connect up the basic system
- Record a basic mix
- Isolate some VCAs
- Use the Solo facility
- Programme some VCA & mute groups
- Edit the mix using Erase
- Edit the mix in Trim Mode
- Save & Load the mix

Following these steps will equip you with the knowledge required to confidently drive the automation system. More in-depth descriptions of the above techniques, and other features, are included throughout the rest of this manual.

1. Connect Up The Basic System

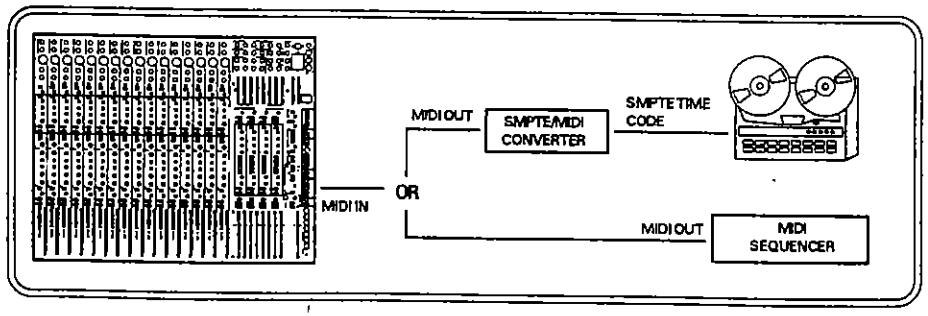
Although the GS3V automation requores no external computer to operate, it is a good idea, for the purposes of this tutorial, to run V-EDIT to give you useful visual feedback. If you want to use V-EDIT then connect up the system as described on page 1 of this section. If you do not want to run V-EDIT you will need to provide the GS3V with a suitable timing reference (MTC or MIDI Clocks) either from a multi-track tape machine (via a SMPTE to MIDI converter) or from a MIDI sequencer.

If you are using V-EDIT:

- Connect up V-EDIT as described on page 1 of this section. Turn on the GS3V and the Atari. Run V-EDIT on the Atari as described previously described. Then select **Connect GS3V** from the **Utilities** menu in the V-EDIT. The faders & mutes on the screen will now be the same as on the console.

If you are <u>not</u> using V-EDIT:

- Connect up your system as shown below. Although your final setup will probably be different from that shown, keeping it simple will avoid any possible system irregularities.



2. Record Your First Mix

- We will record some fader moves on channels 1 to 4. Press **RECORD** to put the system into record ready. The Record LED will flash to show this. Note that the **PLAY** LED automatically turns on.

- Move the faders on channels 1 to 4 to roughly the 0dB positions. Press PLAY on your sequencer/tape machine (if you are connected to V-EDIT you can press ENTER on the numeric keypad of the Atari, this will output MTC to the console). If you are correctly synced the SYNC LED will turn on and the RECORD LED will stop flashing and be on.

- Move the faders on channels 1 to 4. You can also turn some mutes on and off. Note that as you move the faders the EV LEDs will turn on to show that events are being recorded. Note also that the EV-LEDs turn off about a second after the fader stops moving. Stop the sequencer/tape machine (if you are connected to V-EDIT you can press 0 on the numeric keypad to stop outputing MTC). Note that the console automatically drops out of record.

- Rewind your sequencer/tape machine (or press the 0 again if you are connected to V-EDIT). Press PLAY on your sequencer/tape machine again and watch your mix being played back.

- As the mix plays back note that the EV LEDs will turn on as the fader events you recorded are played back. Note that the Null LEDs will turn on and off to show the position of the VCA relative to the fader position.

Thats it!. Recording your mix is as simple as that. Note that the console automatically detected whatever timingsync you used and synchronised to it. The following sections will now concentrate on the other features of the automation for managing and editing your mix.

3. Isolating Faders

Isolation effectively isolates the selected mute or fader from the control of the automation, giving you manual control over it. This is useful, for example, when you are in the process of mixing but want to regain manual control over a channel to record to multi-track for example. Next, we'll isolate the VCA on channel 4.

- Press the **ISOL** button. Then nudge the fader on channel 4 (note that, when used for data entry, the faders are velocity sensitive, i.e. a flick will select a fader, a smooth move will not). The EV LED will turn on to show that the VCA is isolated. Press **ISOL** again.

- Now when you play back the mix again the movements you recorded on the VCA of channel 4 will not be played. Similarly if you were in record mode, any movements you made on these channels would not be recorded. Note that the EV LED on channel 4 still turns on to show that an event has been recorded, but the Null LEDs do not change state showing that the VCA level is not changing.

4. Using Solo & Solo Safes

Your GS3V has a powerful Solo-in-Place facility. A Solo function will mute every channel on the console except for specific channels. This allows you to listen to channels in isolation without affecting the level or stereo image of the signal. Solo safes allow you to select channels that will not be muted during solo (e.g. your effects returns).

Solo-in-place is different from PFL (pre-Fade Listen) in the following respects. PFL allows you to listen to the channel signal in mono for level matching and is non-destructive to the LR mix. Solo-in-place allows you to listen to a channel signal post fader to match the level in the mix and is destructive to the LR mix. Generally use PFL when recording to multi-track; use solo-in-place when performing a mix-down.

- Press the **SOLO** button. All the mutes are now activated except for the effects sends and stereo return mutes (These are automatically set to 'Solo Safe'). Press a mute on the channel you want to listen to. This channel is now effectively soloed. If you exit Solo mode (press **SOLO** again) the channel you selected as solo will be remembered and called up the next time you select Solo.

Putting a channel into Solo-Safe means that it will not be muted when you enter Solo mode. The effects sends and stereo returns are made Solo-Safe by default (you can change this if you want).

5. Setting Up Groups

The V5 AutomationSystem has a powerful grouping facility typically only found on very high-end automated consoles. Grouping effectively allows you to control many VCAs or mutes from a single fader or mute. With V5 Automation you can also have groups within groups within groups etc..

To set up a group you need to select a group master (which will control the group) and then the group slaves (which will be controled by the master, and which can also be masters of other groups). First we will set up some VCA groups on channels 5 to 8.

- First set the faders on channels 5 to 8 to the 0dB position. Press the **GROUP** switch to enter group programming mode.

- Nudge the fader on channel 5. The EV LED will start flashing to show that it is a group master.

- Next nudge the faders on channels 6, 7 and 8. Their EV LEDs will turn on showing that they are slaves of the currently selected master. Press **GROUP** again to exit group programming mode.

- Now move the fader on channel 5 up and down. The Null LEDs on the slaves will change showing that the slave VCAs are being controlled by the master fader on channel 5. If you move the master fader up 5dB it's slaves will also move up by 5dB in relation to their current positions.

You can also set up standard mute groups in a similar fashion. The next section shows you how to set up two different and extremely useful types of mute groups.

6. Setting Up Toggle Mute Groups

With standard mute groups the slaves always follow the state of the master, i.e. master mute on - all slaves on. A toggle group can be used whenever you need flip one set of mutes on, and another set of mutes off. To set set up mute a toggle group on channels 1 to 4 follow this procedure:

- Press **GROUP** and the **TOGGLE** to enter toggle group programming mode.

- Press the mute on channel 1. It's LED will start flashing to show that it's a group master.

- Next press the mutes on channels 2, 3 and 4. Their LEDs will turn on to show that they are slaves of the current master. Press **GROUP** again to exit group programming mode.

- Now turn on channel mutes 2 and 4, then press channel mute 1. Note that pressing the master toggles the states of the mutes in the group.

A possible application for Toggle Groups is as follows. Lets say we are using a synthesiser voice for the verses but are using a totally different voice for the choruses. We can feed the synthesiser into two seperate channels, with seperate EQ & aux send settings appropriate for the two voices. If we assign a **Toggle Group** to these two channels we can simply swap between the two channels, and the different voices, at the touch of a single button for the verse & choruses.

7. Setting Up A Solo Group

A solo group effectively gives you a 'local solo-in-place' anywhere on the console. To set set up a solo group on channels 5 to 8 follow this procedure:

- Press GROUP and then SOLO to enter solo group programming mode.
- Now press the mutes on channels 5, 6, 7 and 8. Their LEDs will turn on to show that they are members of the solo group. Press **GROUP** again to exit group programming mode.
- Press the mutes on channels 5, 6, 7 and 8. Note that pressing a mute will turn it off and all the other group members on.

A solo group can be useful when you have, say, 4 versions of a guitar break on your multi-track from which you need to make a composite track. Using a solo group will allow you to save various mix options for reference and playback before choosing the final version and erasing the source material. Note that only one solo group is allowed on the console.

8. Erasing Events From The Mix

We will now go through the process of erasing some of the fader moves that we recorded earlier on channels 1 to 4.

- Play back the mix that you recorded earlier. Then press **ERASE**. The LED will start to flash.
- Wait for a VCA event to happen on channel 1 (EV LED activating). Either during or after the event has passed, nudge the fader. It's EV LED will flash once to show that it's selected for deletion. Press **ERASE** again to delete the event.
- Now when you play back the mix the event will no longer be there.

V5 Automation allows you to delete individual VCA, mute or Patch Recall events, or you can delete all the events associated with a channel. To delete all events on a particular channel repeat the above procedure with the tape stopped (i.e. no sync). Now delete all VCA events on channels 1 and 2 ready for the next section of the tutorial.

9. Editing The Mix In Trim Mode

For the last part of the tutorial we will go through the process of editing a fader move in trim mode. In trim mode fader movements are recorded as additions to the current moves. This lets you make small adjustments to fader moves or to add an offset to all the moves for a particular channel.

To demonstrate Trim Mode, record the following fader moves on channels 1 & 2. Starting at the bottom of the travel, move the fader up to the 0dB position, then down to the -5dB position, then down to the -10dB position. The effects of editing in trim mode are more apparent if you are using V-EDIT, or if you feed some audio through the channels. First we'll record a trim on channel 1's fader.

- Press **REL** to enter trim mode.
- Press **NULL** to enter free-null mode. Move the fader up to the 0dB position. Press **NULL** again to exit free-null mode.
- Press **RECORD** and start playing the mix.
- When the VCA starts moving up to the 0dB position, move the fader up to the +5dB point. When the VCA starts moving down to the -5dB position return the fader back to the 0dB position.
- Stop recording.

When you play back the mix you will see that the VCA now moves up to the +5dB point. You have added a 5dB offset to the VCA movement.

Next we'll record a trim on channel 2's fader.

- Press **REL** to enter trim mode.
- Press **NULL** to enter free-null mode. Move the fader up to the 0dB position. Press **NULL** again to exit free-null mode.
- Press **RECORD** and start playing the mix.
- When the VCA starts moving up to the 0dB position, move the fader up to the +5dB point and leave it there.
- Stop recording.

When you play back the mix you will see that the VCA now has a 5dB offset added to the move you made. If there were any VCA moves further on in the mix, these too would have the 5dB offset added. If you record any new fader moves to the mix (not in trim mode) these moves would not have 5dB added to them.

10. Saving & Loading a Mix

If you are connected to V-EDIT you can save & load your mixes by selecting **Save** or **Open** from the **File** menu. To save your mix to a sequencer first put the sequencer into record. Then press **MIX** and then **DUMP**. The console will then send all mix data (including patches groups, isolates etc.) to the sequencer as System Exclusive MIDI data. Once in the sequencer the mix data can be archived to floppy disk. To reload a mix, set the sequencer to transmit the the mix data to the console. The console will automatically recognise the data and load in the mix.

SETTING UP YOUR OWN PERSONAL AUTOMATION SYSTEM

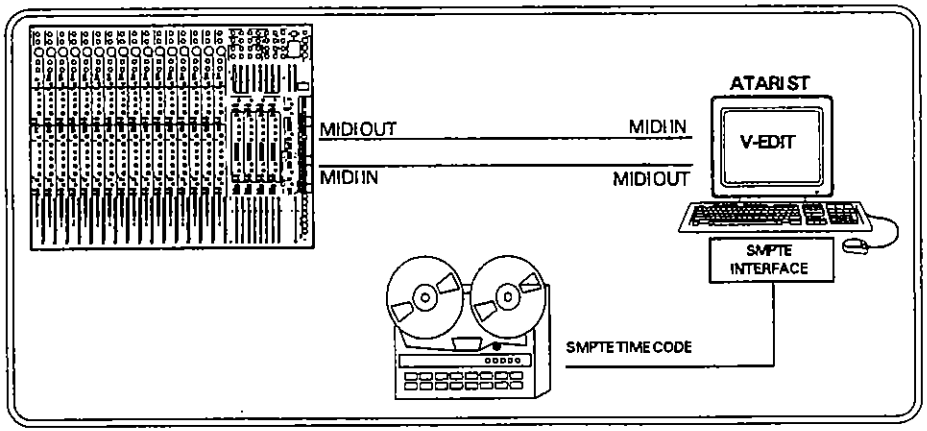
Plan ahead carefully before you start plugging up the equipment. This should prevent time consuming problems later, and ensure that you get the best from your system. Please read the GS3 AUDIO SYSTEMS OWNER MANUAL before installing the audio cables. The way you connect the console automation system depends on the equipment you want to synchronise the automation to, and the way you wish to work. The following interconnection diagrams illustrate the basic configurations. Depending on the other MIDI equipment in your setup you may need to install a suitable MIDI patchbay, splitters or merge boxes. Refer to the owner manuals of your other MIDI equipment or to your local studio supplier should you require further assistance.

The GS3V does not require any external computer or controller to operate as a conventional recording console, with the additional benefits of VCA fader and mute SNAPSHOT memories, mute and fader grouping, and programmable SOLO-IN-PLACE.

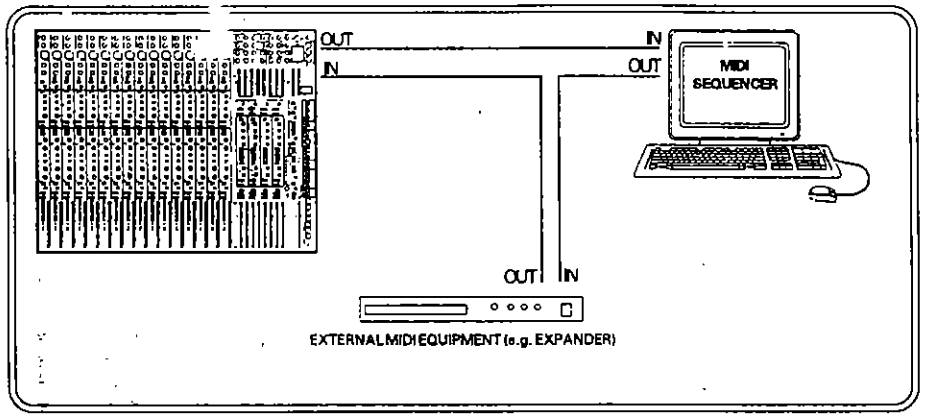
To utilise the GS3V for real-time automation, you require a multitrack tape machine with SMPTE time code on one track and a SMPTE/MIDI converter (see setup including multitrack, timecode and MIDI sequencer). Alternatively, if you are using a MIDI based sequencer, SMPTE time code is not required (see basic stand alone MIDI setup).

The highest level of operation of the GS3V is to use it running the V-EDIT program which requires an Atari ST, TOS V1.2 or later, a monochrome monitor, and a SMPTE/MIDI converter for use with a tape based format (see setup including multitrack, timecode, MIDI sequencer and V-EDIT).

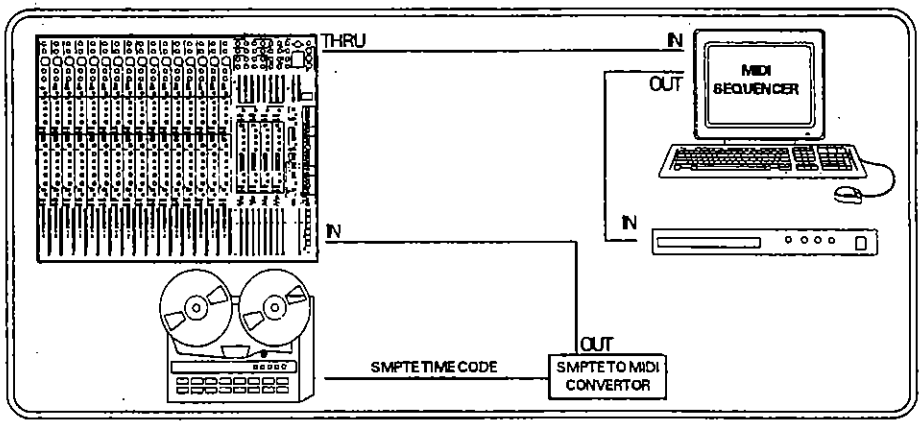
SETUP INCLUDING MULTITRACK AND V-EDIT



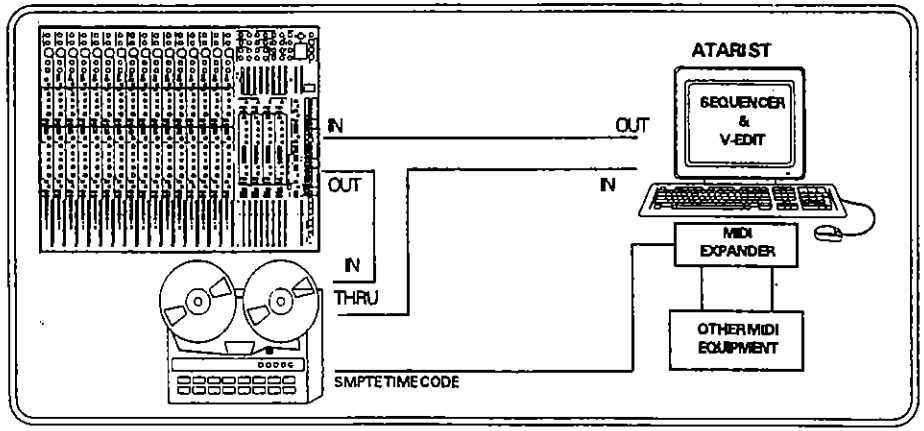
BASIC STAND ALONE MIDI SETUP



SETUP INCLUDING MULTITRACK AND MIDI SEQUENCER

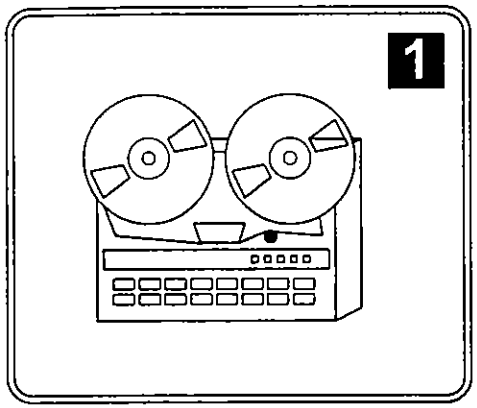


SETUP INCLUDING MULTITRACK, MIDI SEQUENCER AND V-EDIT

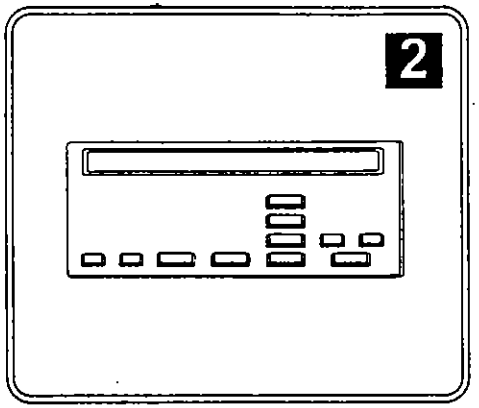


FUNCTION KEY APPLICATIONS

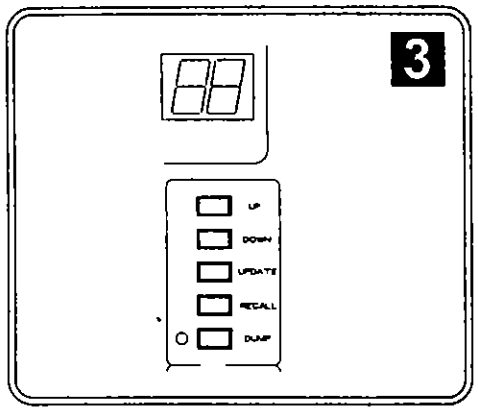
FUNCTION KEYS



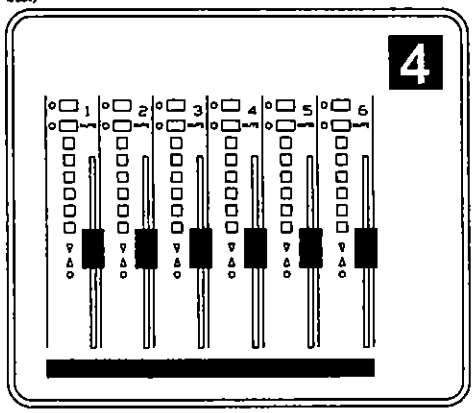
If your tape machine can transmit and receive MIDI, you can use your function keys as a second set of transport controls.



You can use your function keys to control any other MIDI compatible outboard equipment (e.g. Sequencers, Reverbs etc.)



You can use your function keys to recall specific patch numbers.



You can use your function keys to toggle a specific set of mutes (mute presets).

APPLICATION 1:
FUNCTION KEYS AS TAPE MACHINE TRANSPORT CONTROLS

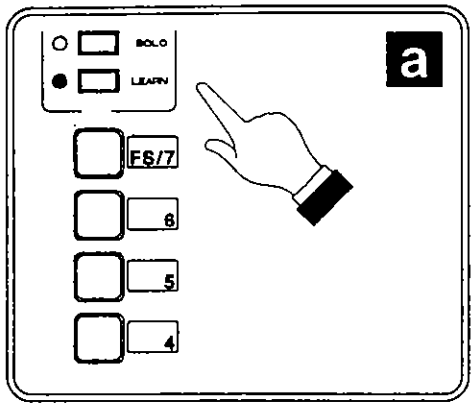
The Function keys are factory programmed for transport control of MIDI Machine Control compatible tape machines. The most commonly used tape transport commands have been selected and programmed on the function Keys. If you have an MMC based tape machine you may decide to mark the the function key write-on strip with the corresponding tape transport command, as below.

F7 - LOCATE
F6 - STOP
F5 - PLAY
F4 - FAST FORWARD WIND
F3 - REVERSE WIND
F2 - INITIALISE (Fostex R8 only)
F1 - SET LOCATE (Fostex R8 only)

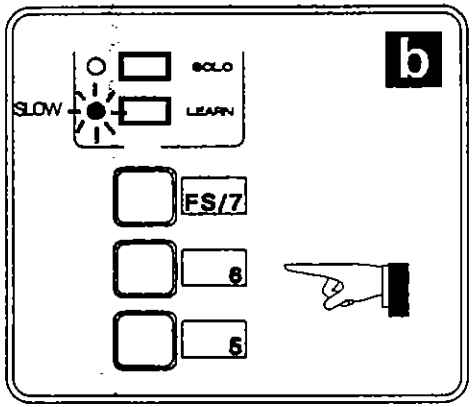
The FUNCTION KEY EDITOR in V-EDIT provides access to programming the function keys with other MMC commands (see MIDI specifications). Follow the same programming procedures as in Application 2: Programming Function Keys to Control External Equipment.

The function keys provide for key press and release MIDI messages. The above factory defaults only use the key press MIDI message. It is possible to cascade two MMC commands for press and release on one key, e.g. for Rewind and Stop.

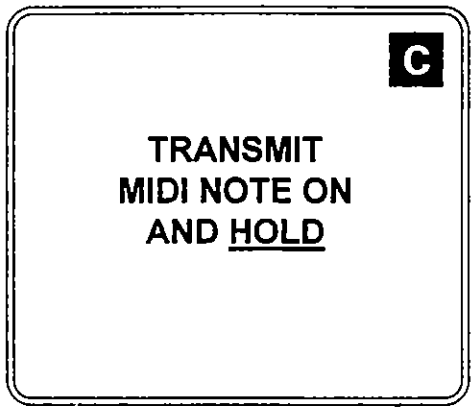
APPLICATION 2:
CONTROLLING EXTERNAL EQUIPMENT



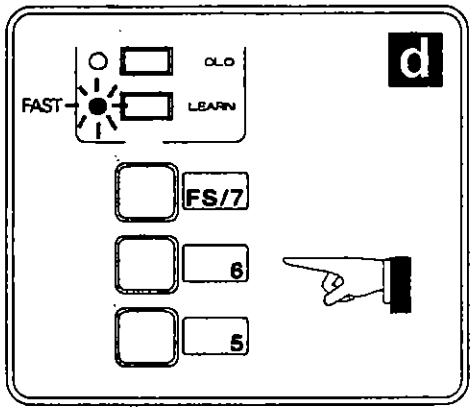
Put the function keys into learn mode. To do this press the **LEARN** switch; the LED will light to confirm the selection.



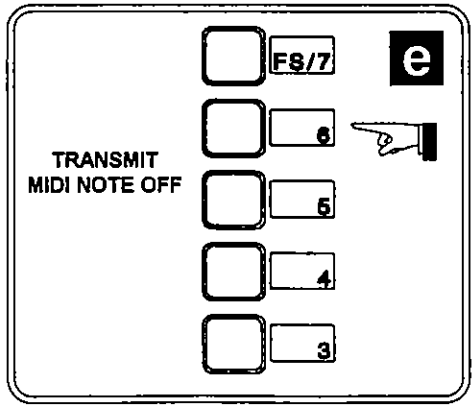
Select which function key is to be programmed. To do this press a **FUNCTION KEY**. The Learn LED will flash slowly.



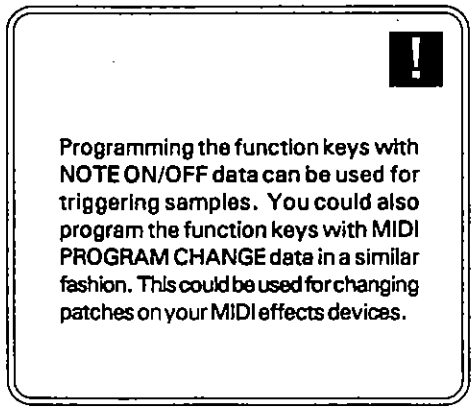
Transmit **MIDI NOTE ON** command to the console by pressing the appropriate key on your external equipment. Remember to **HOLD DOWN THE KEY UNTIL STEP E.**



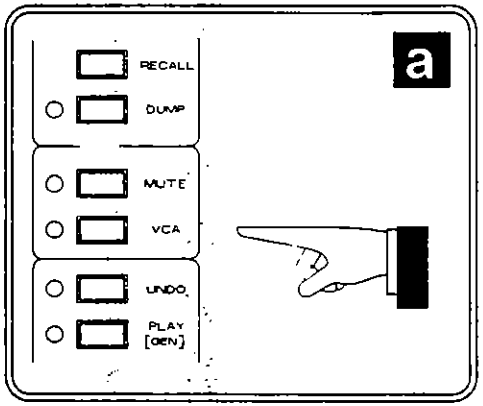
Press the selected function key a second time. The learn LED will flash quickly to confirm the operation.



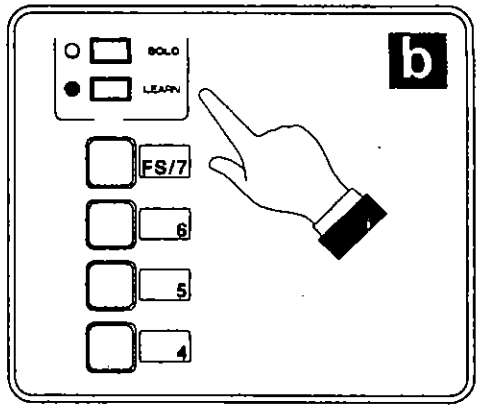
Transmit **MIDI NOTE OFF** command to the console by **RELEASING** the pressed key on your external equipment. Then press the **FUNCTION KEY** again to exit learn mode.



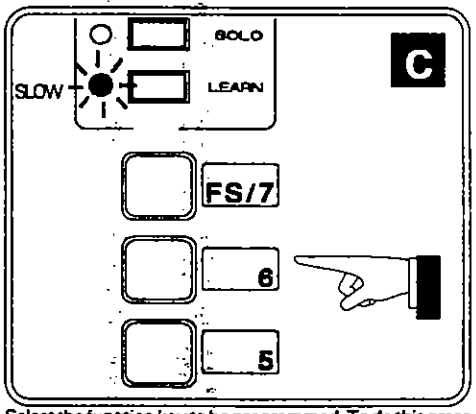
APPLICATION 3:
PROGRAMMING A FUNCTION KEY TO RECALL A PATCH



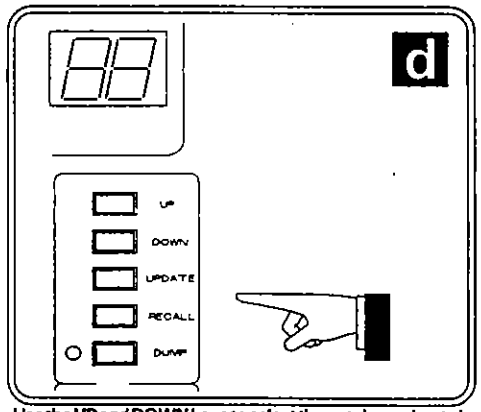
If you only want mutes to be recalled then press the **MASTER MUTE ENABLE** switch. If you want only **VCA's** then press **VCA**. If both are required press **BOTH**.



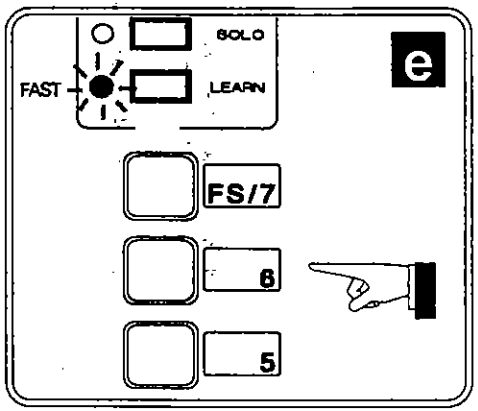
Put the function keys into learn mode. To do this press the **LEARN** switch, the LED will light to confirm the selection.



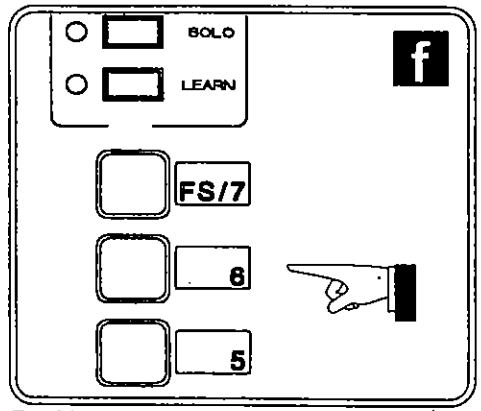
Select the function key to be programmed. To do this press a **FUNCTION KEY**. The learn **LED** will flash slowly. The display will show the function key number.



Use the **UP** and **DOWN** keys to select the patch number to be programmed into the function key when it is **PRESSED**. Then press **RECALL**.

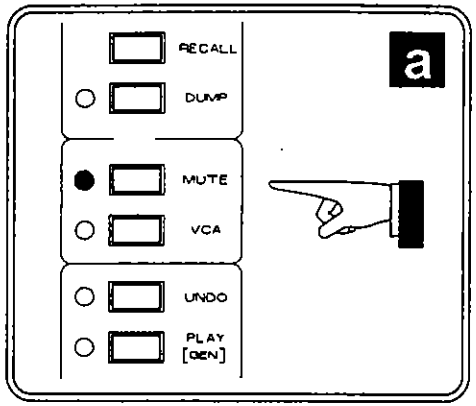


Press the function key again. The learn **LED** will flash quickly. Repeat step **D** to select the patch to be recalled when the function key is **RELEASED**.

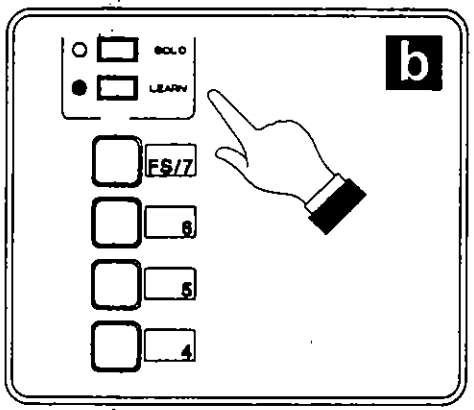


To exit learn mode, press the function key again. The learn **LED** will extinguish.

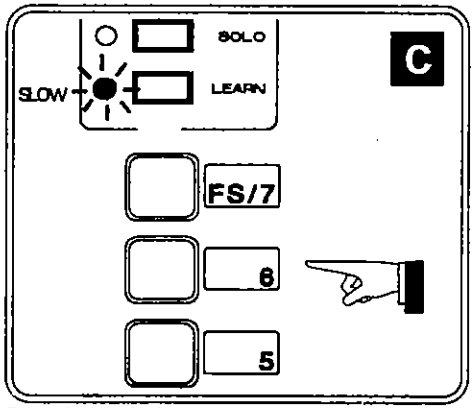
APPLICATION 4:
PROGRAMMING MUTE TOGGLE PRESETS



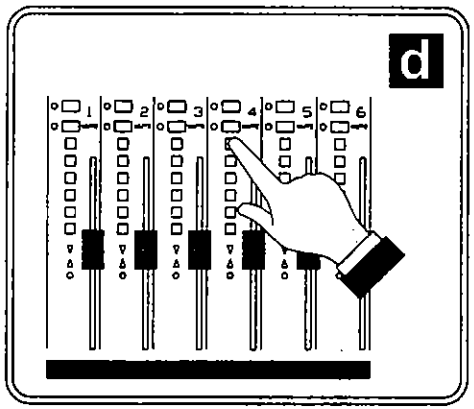
Press the **MASTER MUTE ENABLE** switch; the LED will light to confirm the selection has been made.



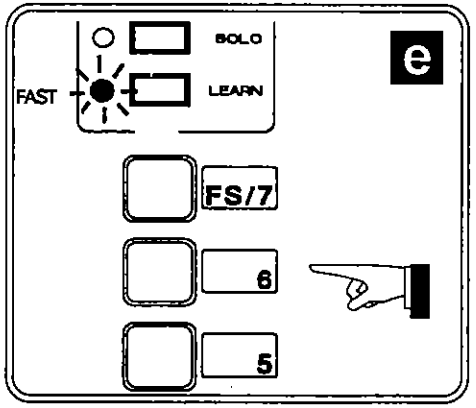
Put the function keys into learn mode. To do this press the **LEARN** switch; the LED will light to confirm the selection.



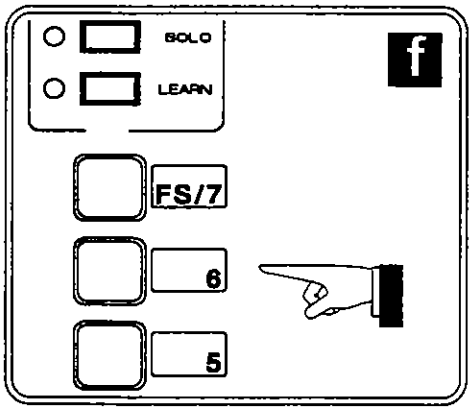
Select the function key to be programmed. To do this press a **FUNCTION KEY**. The learn LED will flash slowly to indicate the selection has been made.



Select which **MUTES** are to be recalled in the toggle preset, when the function key is **PRESSED**. To do this; press the desired **MUTE** switches (**15 MUTES MAXIMUM**)

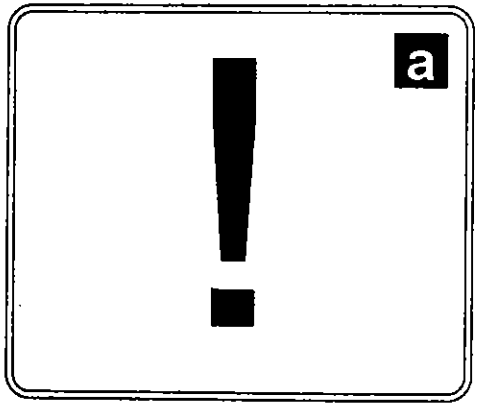


Press the function key again. The Learn LED will flash quickly. Repeat step D to select which **MUTES** are recalled when the function key is **RELEASED**.

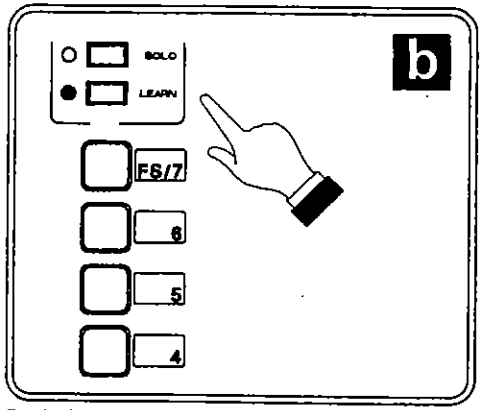


To exit learn mode, press the function key again. The Learn LED will extinguish.

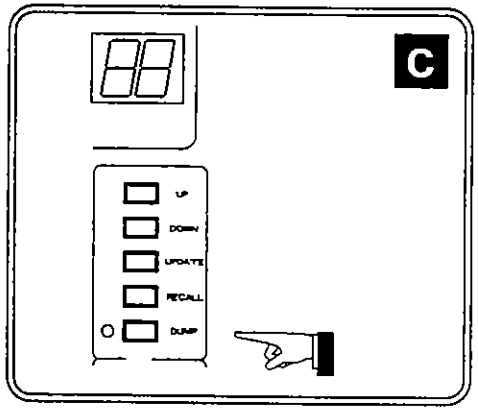
SAVING FUNCTION KEY SET-UPS TO EXTERNAL EQUIPMENT



Make sure your equipment is correctly connected as in the set-up section, and that your external equipment is able to accept MIDI information.



Put the function keys into learn mode. To do this press the **LEARN** switch; the LED will light to confirm the selection.



To save the contents of the function keys to external equipment, press the **DUMP** switch.

WHAT IS V-EDIT

V-EDIT is a graphical display program for the GS3V console. V-EDIT's purpose is to display the actual VCA levels when replaying an automated mix, and to allow you to edit and archive the mix, as well as configure the console settings. Any function on the GS3V can also be done from V-EDIT. V-EDIT has additional features not available on the GS3V. These are:

- the ability to view the *actual VCA levels* during a mix
- setting up groups & programming function keys while the console is in sync.
- naming channels
- setting the SMPTE generator start time

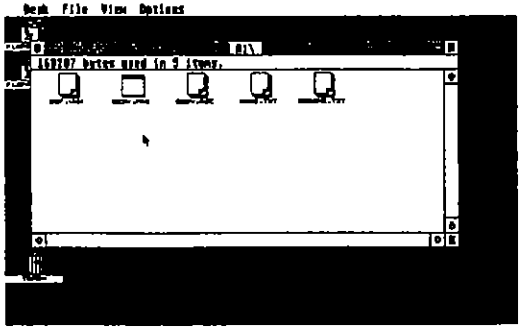
USING V-EDIT

V-EDIT has been designed to be easy and intuitive to operate. All on screen functions operate in the same way as the console's functions. All operations are mouse driven. Keyboard hot keys are also available for commonly used operations. VCA positions can be moved by clicking and dragging the mouse on the VCA icon. Refer to the 'Help' menu for more specific information on using V-EDIT.

RUNNING V-EDIT

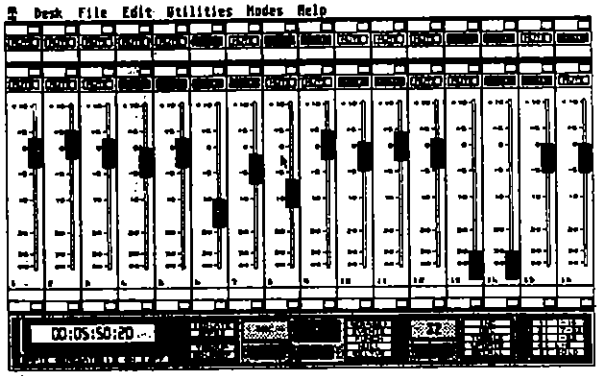
V-EDIT is provided on a single 3.5" floppy disk found on the inside front cover of this manual. V-EDIT runs on any Atari ST1040 or Mega 1/2/4. In order to present enough information on the screen a monochrome monitor is also required.

First connect the GS3 MIDI out to the Atari MIDI in, and the Atari MIDI out to the GS3 MIDI in. Power up the console and turn on the Atari computer. Place the V-EDIT disk provided with this manual into the disk drive and double click on the A drive icon. The following window will appear:



First read the files MROS.TXT and GS3V.TXT for additional important information about using V-EDIT. To do this double click on the icons & select SHOW from the subsequent menu.

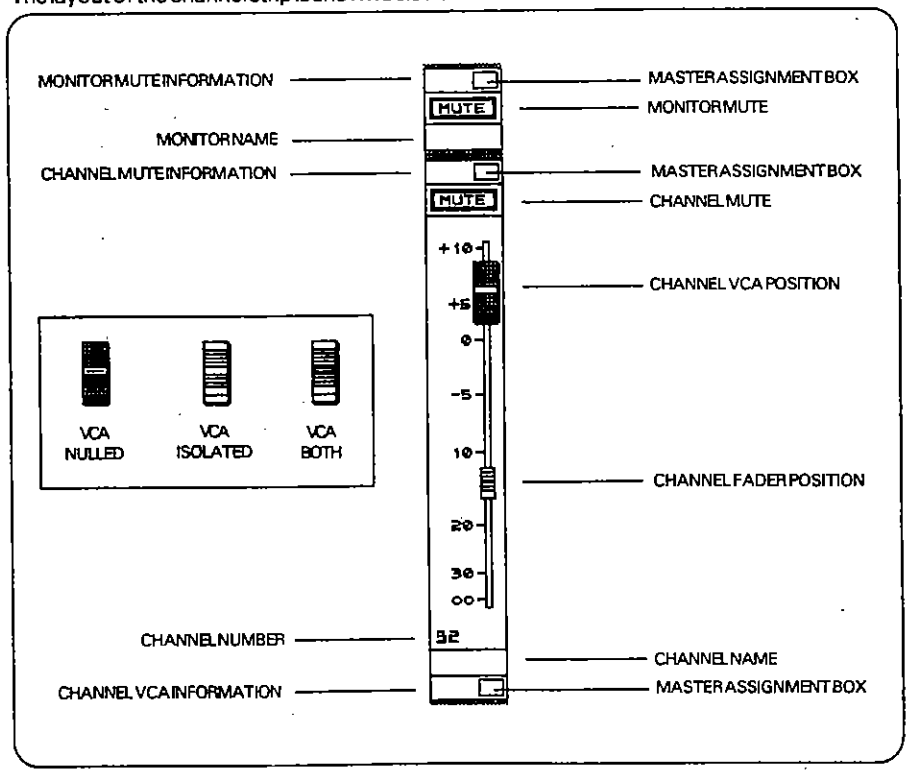
To run V-EDIT double click on the GS3V.PRG icon. The following window will appear:



If V-EDIT is connected to the GS3 the faders and mutes on the screen will reflect the settings on the console. If V-EDIT and the GS3 are not connected at this stage then connect them up, and select **Connect GS3V** from the **Utilities** menu. This will request the GS3 to dump all of it's settings to V-EDIT. Press mutes & move faders on the console and you will see the corresponding changes on the V-EDIT screen.

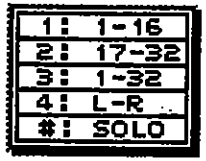
CHANNEL STRIP LAYOUT

The layout of the channel strip is shown below:



The screen is split into 3 sections: the menu bar at the top, the main screen in the middle & the control panel at the bottom. Whereas the menu bar and control panel remain fixed, there are 4 different main screens. To access the different screen press keys 1 to 4 on the keyboard, select a screen from the control panel as shown:

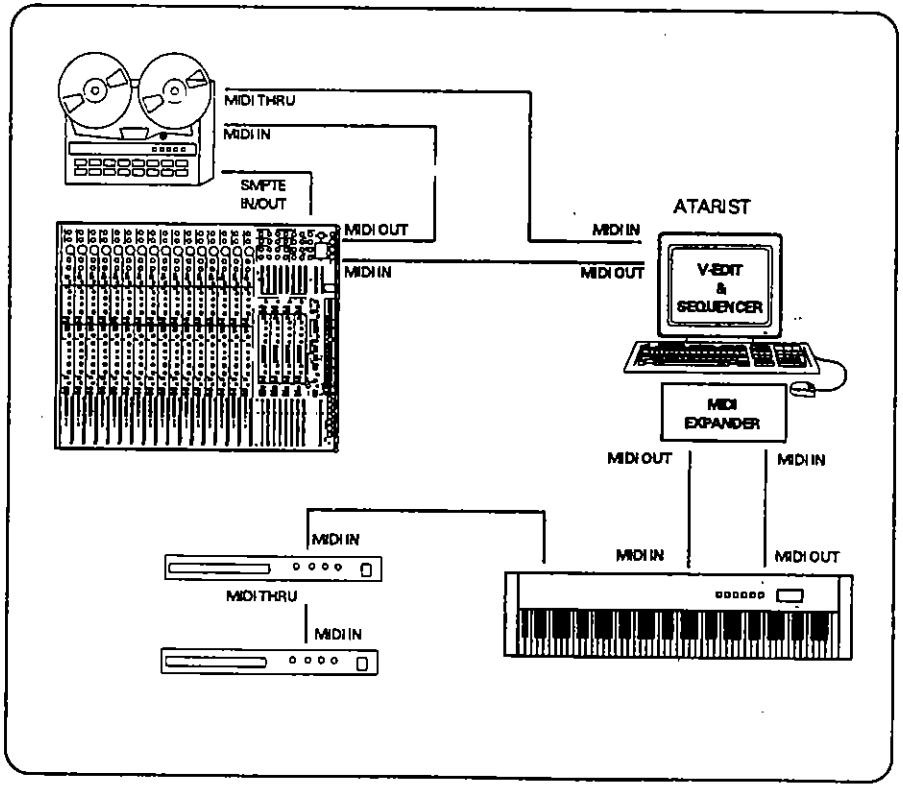
Screen 1	- channels 1 to 16
Screen 2	- channels 17 to 32
Screen 3	- channels 1 to 32
Screen 4	- LR fader & Aux Send/ Stereo Return Mutes



SYSTEM SETUP

Shown below is a typical MIDI system setup, using V-EDIT, upon which you can base your own MIDI setup. It is important to bear in mind, when setting up your system, that the GS3 & V-EDIT must have 2 way MIDI communication (i.e. GS3 MIDI out to V-EDIT MIDI in, and V-EDIT MIDI out to GS3 MIDI in). All connections shown in the examples are MIDI except where otherwise stated.

GS3V, V-EDIT and Multi-Track with ATARI based Sequencer



This setup shows the GS3V and V-EDIT in a typical MIDI setup with a sequencer, MIDI keyboard & expanders. The sequencer can run alongside V-EDIT on the Atari using either M-ROS or Softlink. It is recommended that you use seperate MIDI ports for your console & synthesizer MIDI data by using a MIDI port-expander device.

In this configuration the console gets it's sync from the tape-machine via the optional GS3V SMPTE module (contact your dealer to obtain a SMPTE Option). The console will then output MTC to the Atari where it can be used to synchronise the sequencer (the console must have Mode 12 MTC Regen On enabled. See the section on Modes).

If do not have the SMPTE Module fitted, and your MIDI port-expander device includes a SMPTE reader, you can also connect the SMPTE output from the tape-machine directly to it.

If your tape-machine is MMC (MIDI Machine Control) compatible, using the above configuration allows you to control the tape transport from the console's Function Keys. Otherwise connect the MIDI out from the GS3 directly to the MIDI In of the Atari ST.

INTRODUCTION

MODES

Console modes are used to configure the automatior to suit your particular setup.

Patch Auto-increment

AUTO INC. OFF	*MODE 0*	Disables patch number auto-increment.
AUTO INC. ON	*MODE 1*	Enables patch number auto-increment on.

MIDI Playback

AUTO MIDI PB OFF	*MODE 2*	Disables automatic MIDI playback.
AUTO MIDI PB ON	*MODE 3*	Enables automatic MIDI playback.

Console Modes

OFF	*MODE 4*	If automation is being used independently of any other equipment. No automation MIDI information is received or transmitted to external equipment.
BASIC	*MODE 5*	If automation is being used with basic MIDI equipment that does not under stand mixing consoles. The console transmits & standard MIDI data that is not specific to the console's automation.
ENHANCED	*MODE 6*	If automation is being used with other manufacturers' software that is able to interface with the automation system (e.g. V-EDIT). This mode enables the console to communicate MIDI automation data at it's full potential, providing maximum VCA resolution and can utilise the full range of facilities on V-EDIT.

SMPTE Generator Frame Rate (only if the SMPTE Option is fitted)

24 Frames/s	*MODE 7*	Sets the SMPTE generator frame rate to 24 frames per second.
25 Frames/s	*MODE 8*	Sets the SMPTE generator frame rate to 25 frames per second.
30 Frames/s	*MODE 9*	Sets the SMPTE generator frame rate to 30 frames per second.
Drop Frame	*MODE 10*	Sets the SMPTE generator frame rate to Drop Frames

MIDI Time Code

MTC OUT OFF	*MODE 11*	If the console is synchronised to SMPTE (via SMPTE Option) or to external MTC the console will <u>not</u> output it to MIDI OUT.
MTC OUT ON	*MODE 12*	The console will output MTC to MIDI OUT if it received on MIDI IN or is synchronised to the SMPTE Option.

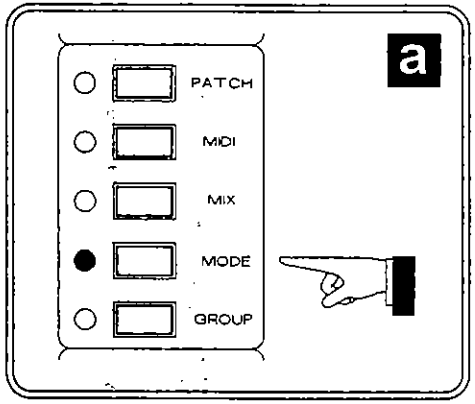
Mirror Mode

MIRROR OFF	*MODE 13*	When programming the console from V-EDIT, all functions will <u>not</u> be mirrored on the console. This allows you to programe the console 'in the background' (e.g. setting up groups while the console is playing a mix).
MIRROR ON	*MODE 14*	When programming the console from V-EDIT, all functions will be mirrored on the console.

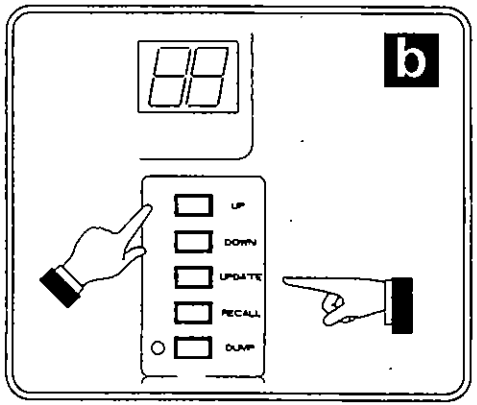
The automation factory defaults are:

- MODE 0: Auto-increment OFF
- MODE 3: MIDI playback ON
- MODE 6: Enhanced Mode
- MODE 8: 25 frames/s SMPTE generator
- MODE 12: MTC output is ON
- MODE 14: Mirror Mode ON

CHANGING THE CONSOLE MODE



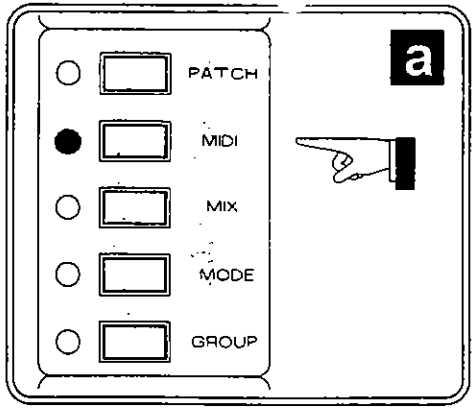
To select console **MODE**, press the **MODE** switch; the **LED** will light to confirm the selection has been made.



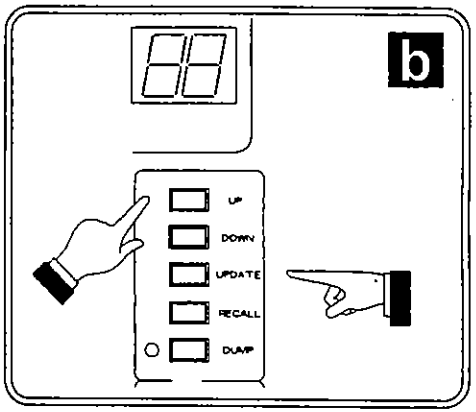
Use the **UP** and **DOWN** keys to select required mode number 1 to 14. When the required mode number is displayed, press **UPDATE** to set. Note, disabled **CONSOLE MODE NUMBERS** will **FLASH**.

CHANGING THE CONSOLE MIDI CHANNEL

To enable the mixer's automation to communicate with the MIDI equipment it is attached to, it is necessary to set both the MIDI equipment and the automation to the same transmit/receive channel. There are 16 MIDI channels available. To set the MIDI channel follow the steps shown below. The factory default MIDI channel is 16.

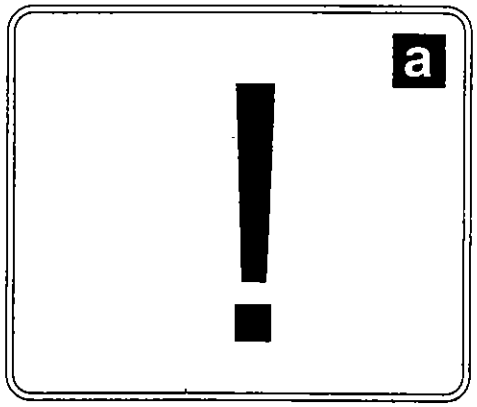


To select the **MIDI CHANNEL**, press the **MIDI** switch; the **LED** will light to confirm the selection has been made.

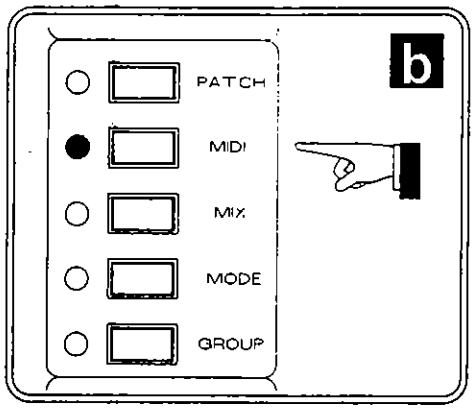


Use the **UP** and **DOWN** keys to select the required MIDI channel number (1 to 16). When required number is displayed, press **UPDATE** to set.

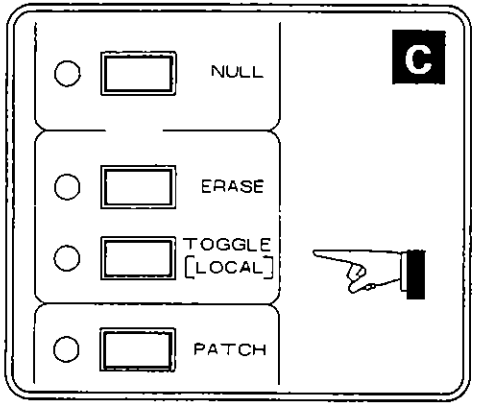
TURNING LOCAL MODE ON AND OFF



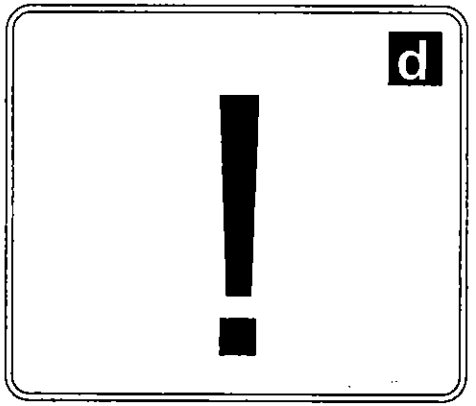
Local **MODE OFF** is only used when automation MIDI data is echoed back to the console by an external MIDI recording device e.g. sequencer.



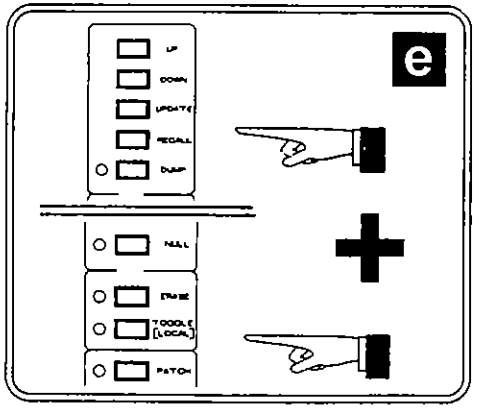
To select **LOCAL MODE ON/OFF** press the **MIDI** switch; the **LED** will light to confirm the selection has been made.



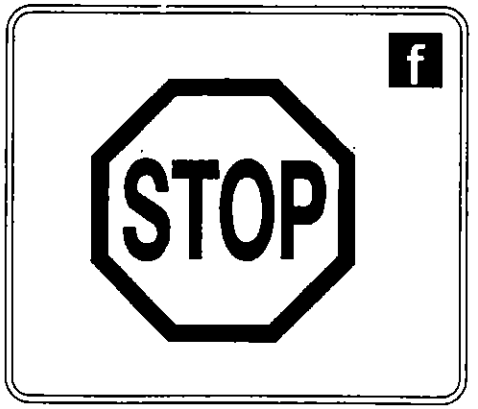
Press the **TOGGLE** switch to set **LOCAL MODE ON** or **OFF**; the LED will light for local mode on and extinguish for local mode off.



The console power up default is **LOCAL MODE ON.** To change the power-on default to **LOCAL MODE OFF** follow step **E**.

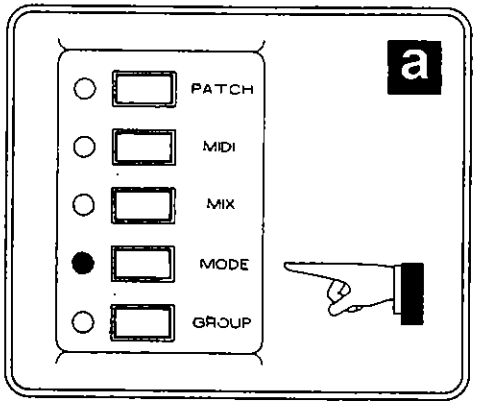


To set the console power up default to **LOCAL MODE OFF**, press **TOGGLE** and **UPDATE** simultaneously.

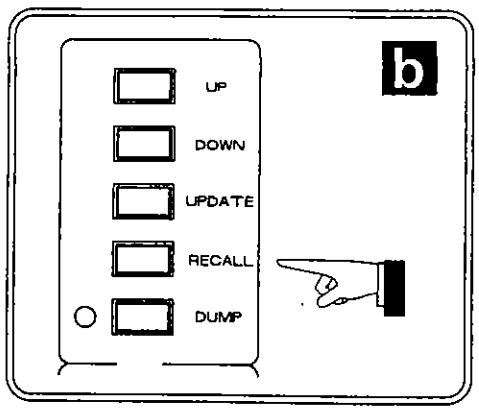


If the console mutes and VCAs do not react to inputs from you, check and make sure that **LOCAL MODE IS ON.**

DISPLAYING THE SOFTWARE VERSION NUMBER



First press the **MODE** switch. The **MODE** LED will turn on to confirm selection.

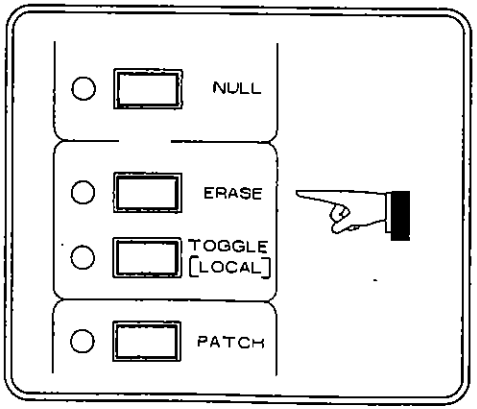


Press **RECALL** and the software version will be displayed. For example, a '4' in the display indicates software version **V5.04**.

PERFORMING A CONSOLE HARD RESET

!

When the console is switched off, all the patches and mix data, as well as the general console settings are saved in battery backed memory. To totally reset the console to the factory default settings, and clear the patch and mix memory, you need to perform a 'hard reset'.



To perform a console hard reset, press & HOLD the ERASE switch when powering on the console.

MIDI SPECIFICATION

MIDI IMPLEMENTATON CHART

MODEL: GS3V - 16
DATE: 18-2-93
VERSION: V5

	Function	Transmitted	Recognized	Remarks
Channel	Default Channel	16	16	See 1
Channel	Basic Channel	1 - 16	1 - 16	MEMORIZED
Mode	Default Messages Altered	N/A	N/A	
Note Number	True Voice	24 - 63 ********	24 - 64	See 2
Velocity	Note On Note Off	0, V = 64 X	0 X	
After Touch	Keys Channels	X 0	X 0	See 3
Pitch Bender		0	0	See 3
Control Change	7 16 - 47 116 - 117	0 0 0	0 0 0	See 4 See 4 See 5
Program Change	True number	0 - 33	0 - 33	
System Exclusive		0	0	Used by V-EDIT
System Common	Song Pos Song Sel Tune	0 X X	0 X X	
System Real Time	Clock Commands	0	0	Start, Stop, Continue
Aux Messages	Local On/Off All Notes Off Active Sense Reset	0 X X X	0 X X X	

Notes:

1 - MIDI Mode enabled
2 - GS3V-24 = 24 - 79, GS3V-32 = 24 - 95
3 - Only in Enhanced Mode
4 - Only In Basic Mode

Mode 1: OMNI ON, POLY
Mode 2: OMNI ON, MONO
Mode 3: OMNI OFF, POLY
Mode 4: OMNI OFF, MONO

0 = YES
X = NO

MUTE TRANSLATION TABLE

HEX	DEC	CHN	MON	A	B	C
0	0			C3		
1	1			C#3		
2	2			D3		
3	3			D#3		
4	4			E3		
5	5			F3		
6	6			F#3		
7	7			G3		
8	8			G#3		
9	9			A3		
A	10			A#3		
B	11			B3		
C	12			C2		C0
D	13			C#2		C#0
E	14			D2		D0
F	15			D#2		D#0
10	16			E2		E0
11	17			F2		F0
12	18			F#2		F#0
13	19			G2		G0
14	20			G#2		G#0
15	21			A2		A0
16	22			A#2		A#0
17	23			B2		B0
18	24	SR1		C1	C0	C1
19	25		FX1	C#1	C#0	C#1
1A	26	SR2		D1	D0	D1
1B	27		FX2	D#1	D#0	D#1
1C	28	SR3		E1	E0	E1
1D	29		FX3	F1	F0	F1
1E	30	SR4		F#1	F#0	F#1
1F	31		FX4	G1	G0	G1

HEX	DEC	CHN	MON	A	B	C
20	32	1		G#1	G#0	G#1
21	33		1	A1	A0	A1
22	34	2		A#1	A#0	A#1
23	35		2	B1	B0	B1
24	36	3		C0	C1	C2
25	37		3	C#0	C#1	C#2
26	38	4		D0	D1	D2
27	39		4	D#0	D#1	D#2
28	40	5		E0	E1	E2
29	41		5	F0	F1	F2
2A	42	6		F#0	F#1	F#2
2B	43		6	G0	G1	G2
2C	44	7		G#0	G#1	G#2
2D	45		7	A0	A1	A2
2E	46	8		A#0	A#1	A#2
2F	47		8	B0	B1	B2
30	48	9		c0	C2	C3
31	49		9	c#0	C#2	C#3
32	50	10		d0	D2	D3
33	51		10	d#0	D#2	D#3
34	52	11		e0	E2	E3
35	53		11	f0	F2	F3
36	54	12		f#0	F#2	F#3
37	55		12	g0	G2	G3
38	56	13		g#0	G#2	G#3
39	57		13	a0	A2	A3
3A	58	14		a#0	A#2	A#3
3B	59		14	b0	B2	B3
3C	60	15		c1	C3	C4
3D	61		15	c#1	C#3	C#4
3E	62	16		d1	D3	D4
3F	63		16	d#1	D#3	D#4

HEX	DEC	CHN	MON	A	B	C
40	64	17		e1	E3	E4
41	65		17	f1	F3	F4
42	66	18		f#1	F#3	F#4
43	67		18	g1	G3	G4
44	68	19		g#1	G#3	G#4
45	69		19	a1	A3	A4
46	70	20		a#1	A#3	A#4
47	71		20	b1	B3	B4
48	72	21		c2	C4	C5
49	73		21	c#2	C#4	C#5
4A	74	22		d2	D4	D5
4B	75		22	d#2	D#4	D#5
4C	76	23		e2	E4	E5
4D	77		23	f2	F4	F5
4E	78	24		f#2	F#4	F#5
4F	79		24	g2	G4	G5
50	80	25		g#2	G#4	G#5
51	81		25	a2	A4	A5
52	82	26		a#2	A#4	A#5
53	83		26	b2	B4	B5
54	84	27		c3	C5	C6
55	85		27	c#3	C#5	C#6
56	86	28		d3	D5	D6
57	87		28	d#3	D#5	D#6
58	88	29		e3	E5	E6
59	89		29	f3	F5	F6
5A	90	30		f#3	F#5	F#6
5B	91		30	g3	G5	G6
5C	92	31		g#3	G#5	G#6
5D	93		31	a3	A5	A6
5E	94	32		a#3	A#5	A#6
5F	95		32	b3	B5	B6

A: Steinberg Pro 24
B: AKAI, YAMAHA, KORG, CUBASE, C-LAB EQUIPMENT
C: ROLAND EQUIPMENT

CHN: CONSOLE CHANNEL INPUT
MON: CONSOLE MONITOR INPUT
SR: STEREO RETURN
FX: EFFECTS SEND

VCA/FADER TRANSLATION TABLE

Console Channel	Basic Mode Faders & VCAs		Enhanced Mode Faders		Enhanced Mode VCAs	
	Controller		Aftertouch		Pitchbend	
	HEX	*DEC*	*HEX*	*DEC*	*HEX*	*DEC*
1	10	16	0	0	0	0
2	11	17	1	1	1	1
3	12	18	2	2	2	2
4	13	19	3	3	3	3
5	14	20	4	4	4	4
6	15	21	5	5	5	5
7	16	22	6	6	6	6
8	17	23	7	7	7	7
9	18	24	8	8	8	8
10	19	25	9	9	9	9
11	1A	26	A	10	A	10
12	1B	27	B	11	B	11
13	1C	28	C	12	C	12
14	1D	29	D	13	D	13
15	1E	30	E	14	E	14
16	1F	31	F	15	F	15
17	20	32	10	16	10	16
18	21	33	11	17	11	17
19	22	34	12	18	12	18
20	23	35	13	19	13	19
21	24	36	14	20	14	20
22	25	37	15	21	15	21
23	26	38	16	22	16	22
24	27	39	17	23	17	23
25	28	40	18	24	18	24
26	29	41	19	25	19	25
27	2A	42	1A	26	1A	26
28	2B	43	1B	27	1B	27
29	2C	44	1C	28	1C	28
30	2D	45	1D	29	1D	29
31	2E	46	1E	30	1E	30
32	2F	45	1F	31	1F	31

V5 SOFTWARE MIDI SPECIFICATION

1. CHANNEL MESSAGES

'n' always = MIDI channel number
(..) means usually ommited due to running status.

1.1 BASIC MODE

Mutes: 9n,ch,vv,[9n],ch,0
- vv: > = 040H = muteon, >0<03FH = muteoff
- ch: console channel number (see MIDI translation chart)

VCA's: Bn,ch,pp
- pp: 127 = unity, 0 = 117dB attenuation
- ch: console channel number + 16 (ie 010H-04FH)
- L-R VCA = 7 (& 8 if right fader present)

MIDI Local mode:
Bn,7A,xx
- xx: 0=off, 1=on

Patch: Cn,pp
- pp: Patch no. in HEX 0H - 01FH = 1 - 32

N.B. Patch attributes taken from current prevailing setting.

1.2. ENHANCED MODE

Faders: An,ch,ff,(An),ch,ii
- ii: Absolute position - integer, range 0 - 117dB
- ch: console channel number + 64, 040H = 1 to 07FH = 64
- ff: Absolute position - fraction, range 0 - .99dB
- ch: console channel number 0 = 1 to 03FH = 64

Mutes: Bn,ww,ch
- ch: channel number (see MIDI translation chart)
- ww: 073H = toggle, 074H = muteon, 075H = muteoff

Patch: Bn,03,mm,Cn,pp
- mm: Patch # In HEX 0H - 020 = 0 - 32
- Bn: Bit0 = 1 = set MUTE attribute, = 0 = off
  Bit1 = 1 = set VCA attribute, = 0 = off
- Cn: Set Patch attributes, tx'd before Program Change message

L-R VCA: Bn,ww,ff,(Bn),ww,ii
- ii: Absolute position - integer, range 0 - 117dB
- ww: L-R or L VCA = 09, R = 0B (if present)
- ff: Absolute position - fraction, range 0 - .99dB
- ww: L-R or L VCA = 08, R = 0A (if present)

L-R Fader: Bn,ww,ff,(Bn),ww,ii

- ii — Absolute position - integer, range 0 - 117dB
- (Bn) — L-R or L Fader = 0D, R = 0F (if present)
- ff — Absolute position - fraction, range 0-.99dB
- Bn — L-R or L Fader = 0C, R = 0E (if present)

Master Event Prefix:

Bn,ww,ch

- ch — 0-63 VCA channel number, or 0-127 Mute number
- id:
  - 50 Master VCA absolute ON
  - 51 Master VCA absolute OFF
  - 54 Master mute toggle
  - 55 Master mute on
  - 56 Master mute off

Master L/R/LR Messages:

Bn,ww,xx

- xx — Data see id....
- id:
  - 5A L-R or L fader Isolation status, xx..1 = off, 0 = on
  - 5B L-R or L fader Punch status, xx..1 = off, 0 = on
  - 5C R fader Isolation status, xx..1 = off, 0 = on
  - 5D R fader Punch status, xx..1 = off, 0 = on
  - 5E L-R or L patch0 integer, xx = position, range 0-117dB
  - 5F L-R or L patch0 fraction, xx = position, range 0-0.99dB
  - 60 R patch0 integer, xx = position, range 0-117dB
  - 60 R patch0 fraction, xx = position, range 0-0.99dB

Event LED On:

Bn,70,xx

- xx — channel number

Event LED Off:

Bn,71,xx

- xx — channel number

MIDI Local Mode:

Bn,7A,xx

- xx — 0=off, 1=on

VCA's: En,ch,ff,(En),ch,ii

- ii — Absolute position - integer, range 0 - 117dB
- (En) — console channel number + 64, 040H = 1 to 07FH = 64
- ff — Absolute position - fraction, range 0-.99dB
- En — console channel number 0 = 1 to 03FH = 64

2. SYSTEM EXCLUSIVE MESSAGES

[...] = optional repeat block
All numbers in HEX unless otherwise specified.

TABLE1

Block ID	Console Channels Covered
bb	ss
	bit 7 6 5 4 3 2 1 0
60	-1 3 5 7 9 11 13
61	-2 4 6 8 10 12 14
62	15-27
63	16-28
64	29-41
65	30-42
66	43-55
67	44-56
68	57-69
69	58-70
6A	71-83
6B	72-84
6C	85-97
6D	86-98
6E	99-111
6F	100-112
70	113-125
71	114-126
72	bit0 = 127, bit4 = 128

2.1. V5 System Exclusive Requests

{header} = F0,00,00,1A,50,pp,ss,0n,...

- 0n — MIDI channel
- ss — Software version
- pp — Product code (GS3V)
- 50 — A&H Product type
- 00,00,1A — A&H id

Dump Direct Patch Request:

{header},40,nn,xx,F7

- xx — Attribute bit0 = 1 = mute, bit1 = 1 = vca
- nn — Patch number 0-20 = Patch 0 to 32

NB Patch data returned as Direct Patches
This message is rx only

Dump All Patches Request:

{header},41,xx,F7

- xx — Attribute bit0 = 1 = mute, bit1 = 1 = VCA

This message is rx only

Dump Virtual Patch Request:

{header},42,xx,F7

xx: Attribute bit0 = 1 = mute, bit1 = 1 = vca

This message is rx only

Dump FKEYS request:

{header},43,vv,F7

vv: Version

This message is rx only

Dump Solo Safes request:

{header},44,vv,F7

vv: Version, (00)

This message is rx only

Dump Isolation Status Request:

{header},45,vv,F7

vv: Version, (00)

This message is rx only

Dump Group Information Request:

{header},46,vv,F7

vv: Version, (00)

This message is rx only

Dump System Status Request:

{header},47,vv,F7

vv: version, (00)

This message is rx only

Dump Faders Request:

{header},48,vv,F7

vv: version, (00)

This message is rx only

Dump MIX Request:

{header},49,ss,F7

ss: MIX number to dump, always 00

This message is rx only

2.2. System Exclusive Control

MPC control:

{header},4B,id1,id2,...,F7

id2: MPC id code, see table 2

id1: type specifier for MPC id code, see table 2

TABLE 2

	id1	id2
All Mutes Off	76H	02H
Erase working mix	76H	03H
Undo last rec pass	76H	04H
Null Update	76H	05H
Record Key	xx	04H
Play Key	xx	05H
Solo Key	xx	06H
Group Hold	xx	07H
Mute Attribute	xx	08H
VCA Attribute xx	09H	
Isolate Key	xx	0AH
Group Key	xx	0BH
Toggle Group	xx	0CH
Solo Group	xx	0DH
Punch Key	xx	0EH
Function Keys	xx	19H - 1FH (keys 1 - 7)
Displayed Patch	79	pp
Toggle Patch No	7A	pp

where xx = 77H for OFF
xx = 78H for ON
pp = Patch Number

Direct Mute Patch Dump:

{header},50,pp,00,bb,ss,..,bb,ss,F7

pp: Direct Patch id

00: Patch number 0-20 = Patch 0 to 32

bb: Patch type = MUTE

ss: Formatted block, see table 1

Direct VCA Patch Dump:

{header},50,pp,01,ii1,ff1,...,ii64,ff64,F7

pp: Direct Patch id

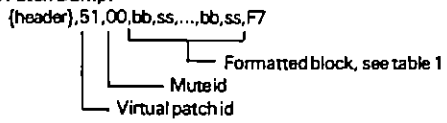
01: Patch number 0-1F = Patch 1 to 32

ii: Patch type = VCA

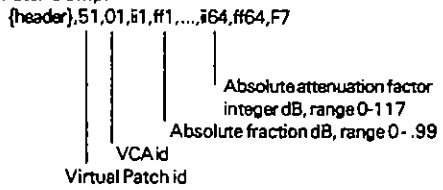
ff: Absolute fraction dB, range 0 - .99

ii: Absolute attenuation factor Integer dB, range 0-117

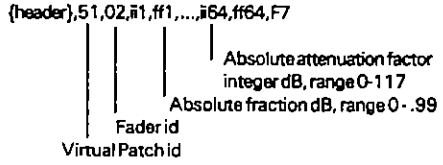
Virtual Mute Patch Dump:



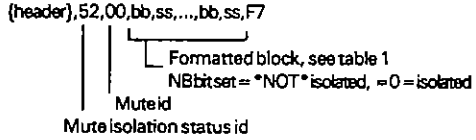
Virtual VCA Patch Dump:



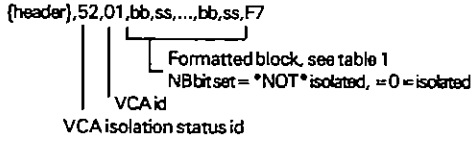
Fader Patch Dump:



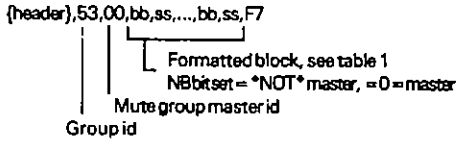
Mute Isolation Status:



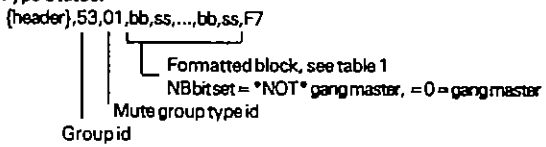
VCA Isolation Status:



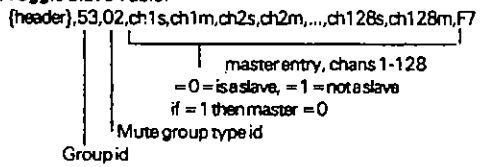
Mute Group Masters:



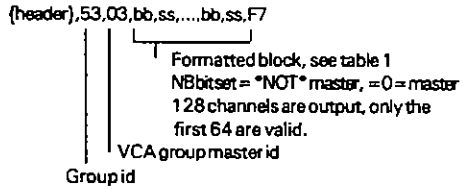
Mute Group Type Status:



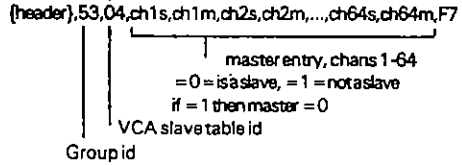
Mute Group/Toggle Slave Table:



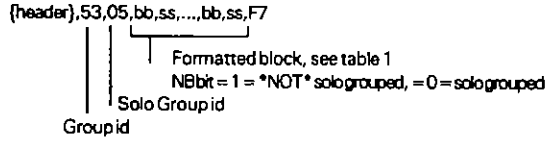
VCA Group Masters:



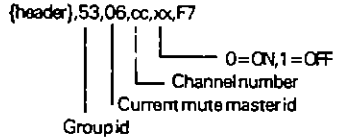
VCA Group Slave Table:



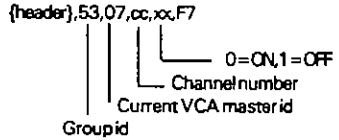
Solo Group Table:



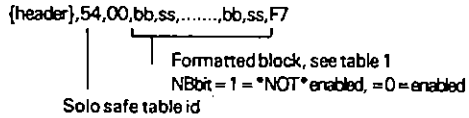
Current Mute Master:



Current VCA Master:



Solo Safe Table:



Mute Punch/Overwrite Status:

{header},55,00,bb,ss,...,bb,ss,F7

- Formatted block, see table 1
  NBbit = 1 = "NOT" enabled, =0 = enabled
- Mute id
- Punch/Overwrite id

VCA Punch/Overwrite Status:

{header},55,01,bb,ss,...,bb,ss,F7

- Formatted block, see table 1
  NBbit = 1 = "NOT" enabled, =0 = enabled
  128 channels are output, only the first 64 are valid.
- VCA id
- Punch/Overwrite id

VCA Punch Data:

{header},56,[pp,ch,ff,ii],[..],[..],F7

- integer attenuation factor in dB's, range 0-117
- fraction dB, range 0 - .99
- VCA channel number 0-3F
- Punch type:
  0 = absolute format
- Table block id

VCA Mode: {header},57,mm,xx,F7

- 01 = ON, 00 = OFF
- Goto:
  1 = relative
  2 = null
  3 = return all vcas to fader positions
  4 = ...
- VCA mode id

V5 Console Modes:

{header},59,vv,F7

- Number to enable
  NB There is no restriction on the number of modes sent, ie 1 or 10
- Console mode set id

Function key dump:

{header},5A,[kk,tt,cm,cl,{data.....},F7

- Type specific data (7-bitised in the following way):-
  [0AAAAAAA, 0BBBBBBB, 0CCCCCCC, 0DDDDDDD, 0EEEEEEE, 0FFFFFFF, 0GGGGGGG, 0ABCDEFG, 0AAAAAAA, 000000A]
- Count LSB
- Count MSB (NB This is a count of 8-bit data)
- TYPE:
  2 = MIDI message press
  3 = MIDI message release
  4 = Patch number press
  5 = Patch number release
  6 = Preset press
  7 = Preset release
- Function key number, 0-6 = key 1-7
- Function key table id

Close of VCA Event Message:

{header},5B,ch,F7

- Channel number

Establish New MIDI Chanel Number:

{header},5C,0n,F7

- MIDI channel number (takes effect imediately)

SMPTE Generator Message:

{header},5D,hh,mm,ss,ff,nn,F7

- 0 - stop generating, 1 - start generating
- start time frames
- start time seconds
- start time minutes
- start time hours (with frame rate encoded as per MTC)

Patch Attributes Change Message:

{header},5E,[pp,xx],[...],F7

- New patch attributes (bit0 = mute, bit1 = vca [1 = ON, 0 = OFF])
- Patch number in hex

Function Key Active Message:

{header},5F,kk,tt,F7

- Type (see Function Key Dump)
- Function key number (0-6 = key 1-7)

Event Erase Message:

{header},60,tt,ch,F7

- Channel/mute/patch number
- Type of erase (0 = mute, 1 = VCA, 2 = patch)

Solo Group Event Message (only used in Mix Dump):

{header},61,ct,fl,co,F7

- Channel number of channel mute turning on
- Flag (1 = channel mute on, 0 = no channel mute on)
- Channel mute to toggle

Enquiry message:

F0,7E,cc,06,01,F7

MIDI channel number

NB If the channel number is 7F the console will still respond.
rx only

Answer enquiry:

F0,7E,cc,06,02,00,00,1A,50,pp,ss,0n,sv,F7

- SMPTE Option version number
- Current MIDI channel number
- Software version number (as SysEx header)
- Product code (GS3V) (as SysEx header)
- A&H Product type
- MIDI channel number

Mix dump:

Standard MIDI FILE DUMP - of a Format 0 MIDI file.

3. SYSTEM COMMON MESSAGES

All numbers in HEX unless otherwise specified.

MIDI Time Code:

F1,dd

dd is nybblized to 0xxxyyyy
yyyy = 4 bits of binary data
xxx = Message type
0 = Frame count LS nybble
1 = Frame count MS nybble
2 = Seconds count LS nybble
3 = Seconds count MS nybble
4 = Minutes count LS nybble
5 = Minutes count MS nybble
6 = Hours count LS nybble
7 = Hours count MS nybble & SMPTE type

Song Position Pointer:

F2,zz,mm

- song position msb
- song position lsb

NB A song position of 0 is considered a START command.
This message is rx only

End of System Exclusive:

F7

NB Termed EOX

4. SYSTEM REAL TIME MESSAGES

All numbers in HEX unless otherwise specified.

Timing Clock: F8

NB rx only

Start: FA

NB rx only

Continue: FB

NB rx only

Stop: FC

NB rx only

Timing Clock: F8

NB rx only

PLEASE READ THIS PAGE

INTRODUCTION

Congratulations on purchasing the Allen & Heath SMPTE Option. This extremely compact SMPTE time code reader & generator is simply the best way of synchronising your GS3V console & multi-track tape recorder. Once synchronised, the GS3V will output MTC (MIDI Time Code) for synchronising other MIDI devices in your system.

The installation and operation of the SMPTE module is described in this manual with easy to follow diagrams and explanatory text. Before installing the module, **please read all instructions carefully.** Make sure you understand all installation procedures before starting. We also recommend that you first become familiar with the function of SMPTE time code by reading this manual and any other manuals relevant to your set-up. Please place this manual in your GS3V manual ring binder for future reference.

The SMPTE Option will only work with V5.03 Automation Software or later. This SMPTE Pack therefore contains a replacement EPROM and an V_EDIT automation software disk for the Atari ST computer. If the software version numbers displayed on the EPROM and V_EDIT disc supplied are a later version than that displayed on your console V-PROM label, you will have replace the EPROM in your console with the one supplied in the pack. A complete procedure on how to do this is printed in this manual.

The installation of the SMPTE module and EPROM can easily be carried out by a non technical person. If for any reason you do not feel confident about undertaking the work, then contact your supplier's technical support line; they will be able to offer you further assistance.

KEY FEATURES

The SMPTE option module has many features. It

- ✓ can read and generate time code direct to and from the console.
- ✓ automatically detects the frame rate used.
- ✓ is factory set to operate with low level (-10dBV) equipment.
- ✓ is link selectable to operate with high level (+4dBu) equipment.
- ✓ has input and output on a single 1/4" stereo jack socket (tip = generate, ring = read).
- ✓ has programmable generator start time and frame rate using V_EDIT.
- ✓ is simple and easy to install.

FRAME RATES:

READ ..... 24, 25, 30 & Drop Frame

GENERATE ..... 24, 25, 30 & Drop Frame

SIGNAL LEVELS:

INPUT OPERATING RANGE ..... -30dBV to 20dBV

2 FIXED OUTPUT LEVELS ..... -16dBV or -2dBu (link selectable)

TAPE SPEED SYNC RANGE ..... +/-1 Octave

FACTORY DEFAULT SETTINGS:

FRAME RATE ..... 25 frames per second.

GENERATOR OUTPUT LEVEL ..-16dBV

GENERATOR START TIME 00.00.00.00

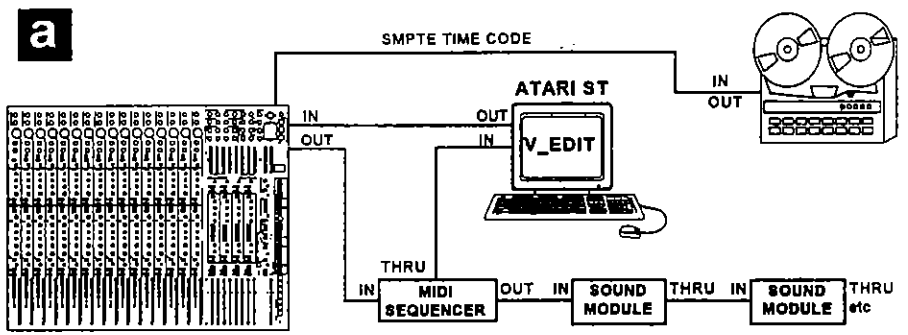
Before installing the SMPTE module PCB please check the contents of this pack against the list below:

1x	SMPTE module PCB.	(A&H No: ZX000-239)
1x	V_EDIT Software disk for the ATARI ST computer.	(A&H No: AP0197)
1x	V5 Automation EPROM IC.	(A&H No: AE0346)
1x	SMPTE User Manual.	(A&H No: AP0141)
1x	"Fitted" printed self adhesive label.	
1x	self adhesive label printed with Software Version.	

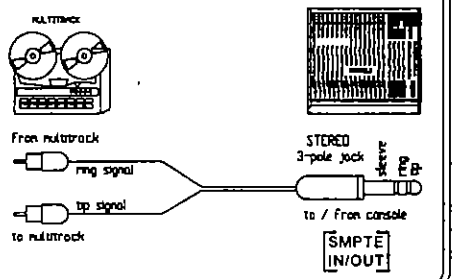
The last 2 items are to be stuck onto the V-PROM label.

SETUP INCLUDING MULTITRACK, MIDI SEQUENCER AND V_EDIT.

a

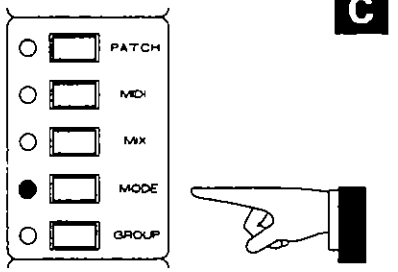


b



You will need to wire up a lead to connect the tape **IN** and **OUT** of your tape machine to the stereo 1/4" jack **SMPTE IN/OUT** on the console.

c

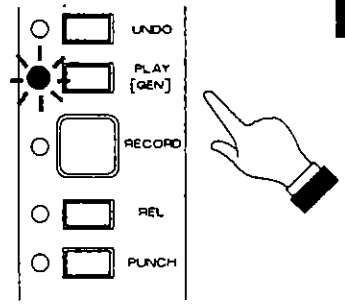


The first thing to do is to record SMPTE time code onto a track of your tape machine. Press the **MODE** switch the LED will light to confirm the selection.

d

Set your tape machine to record and run the tape. It is usual practice to record time code onto an outside track of your tape machine.

e

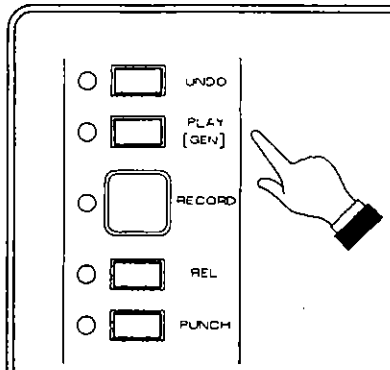


To start the time code generator, press the **PLAY** switch. The LED will flash to confirm the selection. Note: the time code start time can be set from V_EDIT.

g

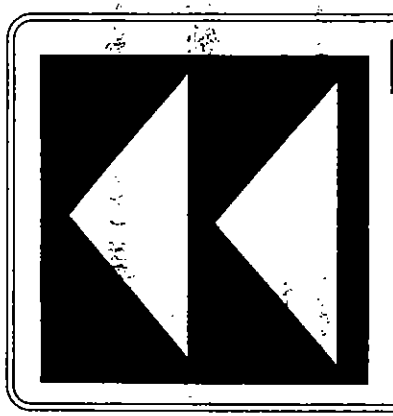
When you have recorded SMPTE time code on the full length of the tape, stop your tape machine.

h



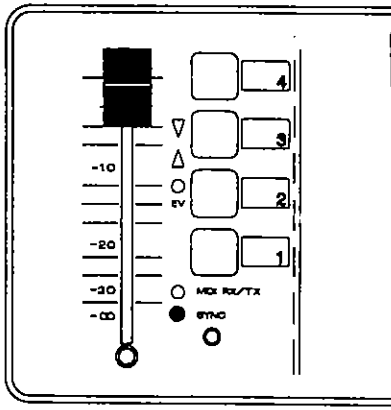
Press the **PLAY** switch to stop the generator. The LED will extinguish.

i



Rewind the tape to a suitable position and press play.

j



The **SYNC LED** will light to confirm that the console is synchronised to the time code. Note: the counter on V_EDIT will also display the current time code position.

NOTE

When generating SMPTE time code you can exit **MODE** and carry out other functions e.g. setting up mute/VCA groups etc., whilst still generating time code. You cannot, however, get sync from the SMPTE option when generating. To exit **MODE**, press the **MODE** switch the LED will extinguish. To stop the SMPTE generator simply press the **MODE** switch followed by the **PLAY** switch.

Always "stripe" the tape in one continuous pass.

Always run the time code inputs and outputs directly to and from the console and the tape machine. DO NOT RUN THE TIME CODE THROUGH YOUR CONSOLE OR PATCHBAY.

MODES

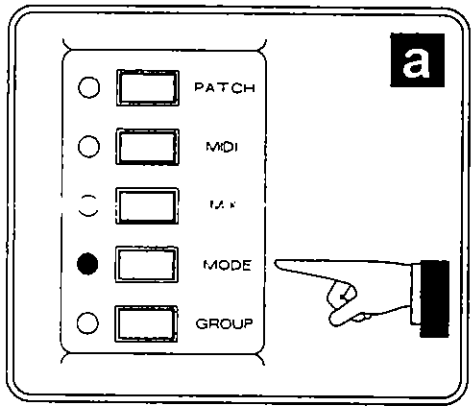
CONSOLE MODES

The SMPTE module is factory set to generate time code at **25 FRAMES (MODE 8)** on power up. If you want to generate at a different frame rate it is necessary to set up the console to the particular frame rate you wish to use. This is done by selecting one of the console modes as follows:

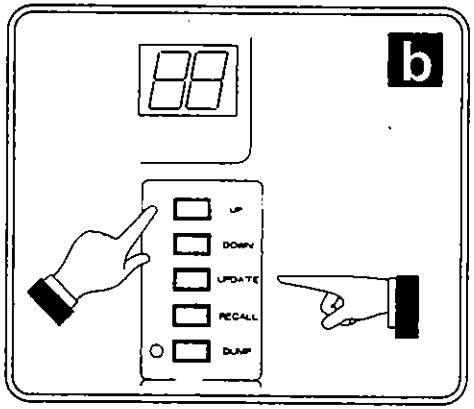
24 FRAMES	**MODE 7**	Sets the SMPTE generator rate to 24 frames per second.
25 FRAMES	**MODE 8**	Sets the SMPTE generator rate to 25 frames per second.
DROP FRAME	**MODE 9**	Sets the SMPTE generator to Drop frame mode.
30 FRAMES	**MODE 10**	Sets the SMPTE generator rate to 30 frames per second.

There are several other modes; MODE 0 to MODE 6 and MODE 11 to MODE 14. These are refered to in the Modes section of the GS3V Automation Systems manual (A&H No: AP0140).

To change mode, follow the steps shown below.



To select console **MODE**, press the **MODE** switch; the **LED** will light to confirm the selection has been made.



Use the **UP** and **DOWN** keys to select required mode number 7 to 10. When required mode number is displayed, press **UPDATE** to set. Note, non selected **CONSOLE MODE NUMBERS** will **FLASH.**

Once the frame rate has been set, the console will power up with this frame rate until it is changed.

To return to the factory default setting, hold down the ERASE switch on power up. WARNING! This will reset <u>all</u> the console settings to the factory default.

FRAME RATE AUTODETECTION

The procedure above only sets the Frame Rate for the time code generator. The time code reader automatically detects the Frame Rate being used when the tape is first run after the console is powered on.

If you are using different Frame Rates in a session, you will need to invoke the frame rate autodetection function for the new Frame Rate. This can be done in a number of ways:

1) Erasing the mix in the console's memory by pressing the MIX switch followed by the ERASE switch twice. (i.e. MIX ERASE ERASE)
2) Running the console's time code generator for a few seconds.
3) Temporarily removing the power from the console for a few seconds.

INTRODUCTION

This is the AUTOMATION OWNER MANUAL for the GS3 audio mixing console upgraded with Allen & Heath's V5 VCA Automation System. The operation of the mute and VCA fader automation is described with easy to follow diagrams and explanatory text.

Before using your automation please read the **Getting Started** section. This will introduce you to the system and take you through a step-by-step procedure of creating an automated mix. The rest of the manual can be used as a reference which you can use to get more in-depth descriptions of the automation functions. We also recommend that you first become familiar with the layout and function of your console by reading your GS3 AUDIO SYSTEMS OWNER MANUAL.

Your GS3 Upgrade is accompanied by the Allen & Heath V_EDIT automation control/display software disk for the Atari ST computer. All automation functions are performed using V-EDIT.

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GS3 V5 Upgrade Automation Manual
Publication AP0188 issue 1 October 1993
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GETTING STARTED

INTRODUCTION

Your GS3 Upgrade has taken your standard GS3 console fitted with V4 Mute Automation & provided it with Allen & Heath's powerful V5 Automation for faders & mutes. The new automation features are:

- VCA fader automation on all channel faders and the LR master fader
- In-built SMPTE Reader/Generator for direct synchronisation to multi-track recorders
- MMC (MIDI Machine Control) Function Keys for transport control of MMC compatible tape machines
- Comprehensive VCA grouping including multiple nested masters
- Three different types of mute grouping
- 33 patches for faders & VCA levels
- Mute & VCA isolation facilities
- Solo-in-place with programmable solo safes.
- Comprehensive mix editing facilities.
- Direct mix archiving to floppy disk using V-EDIT
- Graphical display of console automation status & configuration with V-EDIT

AUTOMATION SPECIFICATION

- Up to 32 automated VCA channels (plus LR master fader)
- VCAs recorded to frame accuracy, mutes recorded to bit accuracy (1/80th frame)
- VCA hardware resolution 4096 steps; 11700 step software (MIDI) resolution in Enhanced Mode. 127 VCA steps in Basic Mode
- Internal memory for a 10 to 20 minute active mix

BASIC ASSUMPTIONS

Before continuing with this section please check that:

- The console hardware upgrade has been performed & the console is fully tested & functional, as specified in the GS3 V5 Upgrade Installation Manual.
- You are familiar with the use of an Atari ST computer.

HOW THE SYSTEM WORKS

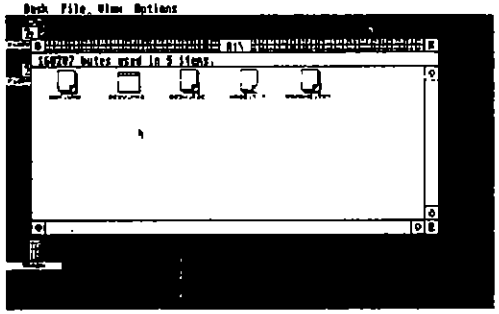
V-EDIT's purpose is to display the actual VCA levels and mute states when replaying an automated mix. It allows you to edit and archive the mix, as well as configure the console settings. The GS3 contains a micro-computer which reads and controls the faders/VCAs and mutes. It transmits the console status, via MIDI, to V-EDIT where it is displayed. All automation settings and mix information is stored in the console. When saving a mix, for example, the mix data is transmitted from the console to V-EDIT where it can be saved to floppy disk.

VCAs EXPLAINED

In the standard GS3 the audio passes through the faders whose position controls the audio level. In the GS3 V5 Upgrade the audio now passes through VCAs (Voltage Controlled Amplifiers). When you record your fader moves, the console's computer reads the positions of the faders and stores them internally. When you play back the mix, the computer sends the stored fader positions to the VCAs which then control the actual audio level.

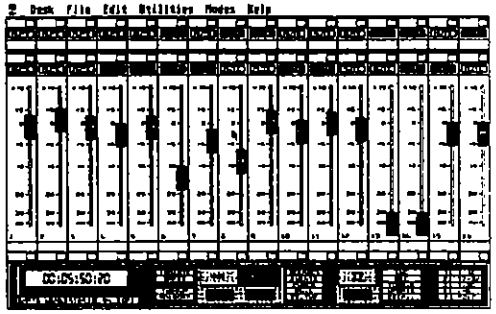
RUNNING V-EDIT

First connect the GS3 MIDI out to the Atari MIDI in, and the Atari MIDI out to the GS3 MIDI in. Power up the console and turn on the Atari computer. Place the V-EDIT disk provided with this manual into the disk drive and double click on the A drive icon. The following window will appear:



First read the files README.TXT and MROS.TXT for additional important information about using V-EDIT. To do this double click on the icons & select SHOW from the subsequent menu.

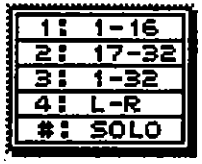
To run V-EDIT double click on the GS3V.PRG icon. The following window will appear:



If V-EDIT is connected to the GS3 the faders and mutes on the screen will reflect the settings on the console. If V-EDIT and the GS3 are not connected at this stage then connect them up, and select **Connect GS3V** from the **Utilities** menu. This will request the GS3 to dump all of it's settings to V-EDIT. Press mutes & move faders on the console and you will see the corresponding changes on the V-EDIT screen.

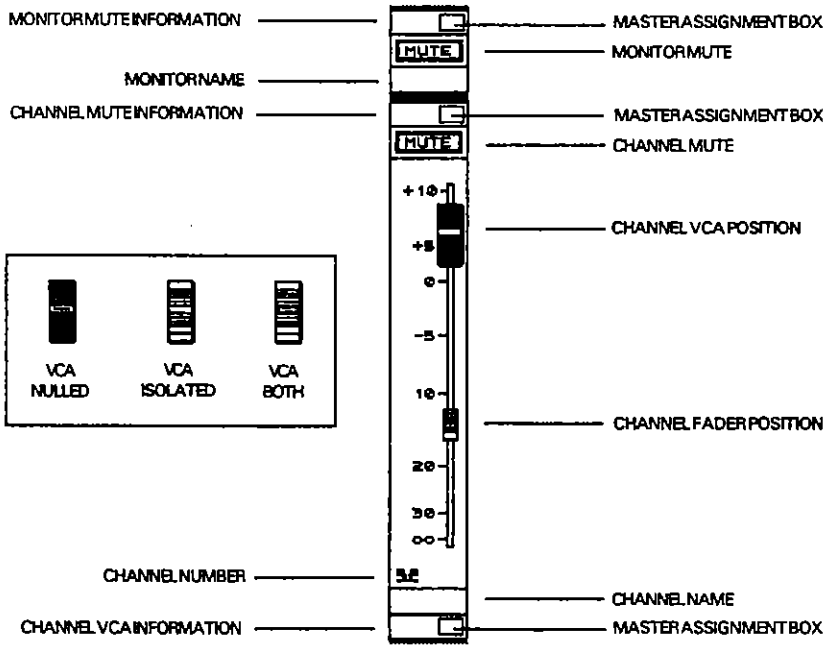
The screen is split into 3 sections: the menu bar at the top, the main screen in the middle & the control panel at the bottom. Whereas the menu bar and control panel remain fixed, there are 4 different main screens. To access the different screens press keys 1 to 4 on the main keyboard (not the numeric keyboard), select a screen from the control panel as shown:

Screen 1 - Channels 1 to 16
Screen 2 - Channels 17 to 32
Screen 3 - Channels 1 to 32
Screen 4 - LR fader, Aux Send & Stereo Return Mutes



CHANNEL STRIP LAYOUT

The layout of the channel strip is shown below:



TUTORIAL - RECORDING YOU FIRST MIX

This section will give you a quick guided tour of the automation system by performing an automated mix. The steps you will carry out are:

- Connect up the basic system
- Record a basic mix
- Isolate some mutes & VCAs
- Programme some solo safes
- Give the channels names
- Programme some VCA & mute groups
- Edit the mix using erase
- Edit the mix in Trim Mode
- Save the mix
- Load a mix

Following these steps will equip you with the knowledge required to confidently drive the automation system. More in-depth descriptions of the above techniques, and other features, are included throughout the rest of this manual.

1. Connect Up The Basic System

First connect the GS3 to the Atari using MIDI.

- Connect the MIDI out of the GS3 to the MIDI in of the Atari, and the MIDI out of the Atari to the MIDI in of the GS3. Although your final system setup may be different, this simpler setup will prevent any possible system irregularities.

- Turn on the GS3 and the Atari. Run V-EDIT on the Atari as described in the previous section. Then select **Connect GS3V** from the **Utilities** menu on the Atari. The faders & mutes on the screen will now be the same as on the console.

2. Record Your First Mix

- We will record some fader moves on channels 15 & 16. Select **RECORD** from the control panel or press **R** on the keyboard to put the system into record ready. Note that the **PLAY** button automatically activates.

- Press ENTER on the numeric keypad of the Atari. Note that the time-code display starts counting.

- Move the faders on channels 15 & 16. You can also turn some mutes on and off. Press **0** on the numeric keypad to stop the recording. Note that the console automatically drops out of record.

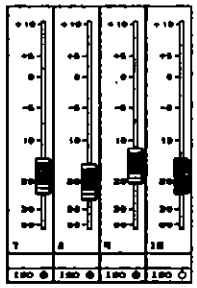
- Press the **0** again to reset the time to the beginning. Press ENTER again and watch your mix being played back.

That's it! Recording your mix is as simple as that. Pressing ENTER on the numeric keypad causes V-EDIT to output MIDI Time Code (MTC). Note that the console automatically detected this and synchronised to it. The following sections will now concentrate on the other features of the automation for managing and editing your mix.

3. Isolating Faders

Isolation effectively isolates the selected mute or fader from the control of the automation, giving you manual control over it. This is useful, for example, when you are in the process of mixing but want to regain manual control over a channel to record to multi-track.

- Select **ISOLATE** from the control panel, or press I on the keyboard. Click in the status boxes of VCA channels 7,8 & 9 to isolate them as shown. Note that the VCA icons change to show isolation status. You can isolate some mutes in a similar fashion.



- Now when you play back the mix again the movements you recorded on VCA channels 7, 8 & 9 will not be played. Similarly if you were in record mode, any movements you made on these channels would not be recorded.

An alternative way to isolate faders & mutes is to select **Isolate** from the **Edit** menu. This will allow you to isolate all VCAs or all mutes with one mouse click.

4. Programming Solo Safes

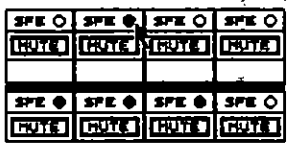
Your GS3 now has a powerful Solo-in-Place facility. A Solo function will mute every channel on the console except for specific channels. This allows you to listen to channels in isolation without affecting the level or stereo image of the signal. Solo safes allow you to select channels that will not be muted during solo (e.g. your effects returns).

Solo-in-place is different from PFL (pre-Fade Listen) in the following respects. PFL allows you to listen to the channel signal in mono for level matching and is non-destructive to the LR mix. Solo-in-place allows you to listen to a channel signal post fader to match the level in the mix and is destructive to the LR mix. Generally use PFL when recording to multi-track; use solo-in-place when performing a mix-down.

- Press # on the keyboard or select **SOLO** from the control panel. All the mutes are now activated except for the effects sends and stereo return mutes (These are automatically set to 'Solo Safe'). Press a mute on the channel you want to listen to. This channel is now effectively soloed. If you exit Solo mode (press # again) the channel you selected as solo will be remembered and called up the next time you select Solo.

Putting a channel into Solo-Safe means that it will not be muted when you enter Solo mode. The effects sends and stereo returns are made Solo-Safe by default (you can change this if you want).

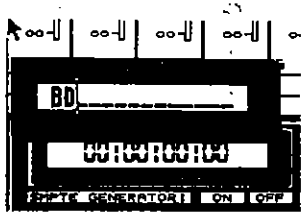
- To programme Solo Safes select **SAFES** from the control panel or press A on the keyboard. Click on the status boxes of the channels you want to make Solo Safe, as shown:



An alternative way to make channels Solo Safe is to select **Safes** from the **Edit** menu. This will allow you to select all channels or monitors to be Solo Safe with one mouse click.

5. Naming Channels

V-EDIT gives you the ability to name the channels and monitors for quick & easy identification.



- To name a channel click in the channel's Name box. Then type the channel name into the dialog box and press RETURN.

- Name the rest of the channels as follows ready for the next part of the tutorial on Groups:

1.	BD	(BassDrum)	5.	TT2	(TomTom 2)	9.	OHR	(Right Overhead)
2.	SN	(Snare)	6.	TT3	(TomTom 3)	10.	BASS	
3.	HH	(High Hat)	7.	TT4	(TomTom 4)	11.	GTRL	
4.	TT1	(TomTom 1)	8.	OHL	(Left Overhead)	12.	GTRR	

6. Setting Up Groups

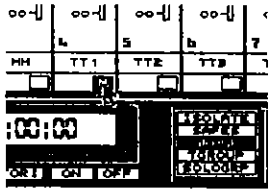
The V5 Automation System has a powerful grouping facility typically only found on very high-end automated consoles. Grouping effectively allows you to control many VCAs or mutes from a single fader or mute. With V5 Automation you can also have groups within groups within groups etc..

To set up a group you need to select a group master (which will control the group) and then the group slaves (which will be controled by the master, and which can also be masters of other groups). First we will set up some VCA groups using the channels we named above.

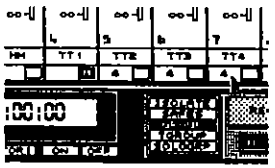
- First set all the faders to roughly the 0dB position.

- Select **GROUP** from the control panel or press G on the keyboard.

- We will first set up a group on the tom-toms with TT1 being the group master. Click in the status box for channel 4. An 'M' will appear in the box showing that it is a group master, as shown:



- Next assign TT2, TT3, & TT4 as group slaves by clicking in their status boxes. The slaves will then show a '4' in their status boxes showing that they are slaves of channel 4's VCA, as shown:



- Now move the fader on channel 4 on the console. If you move the master fader up 5dB it's slaves will also move up by 5dB in relation to their current positions.

- Next assign OHL as a master of OHR in a similar fashion.

- Next assign the bass drum BD as a master of the snare (SN), high-hat (HH), tom-toms (TT1), and overheads (OHL). The bass drum is now the master of the whole drum kit (Hint: if you hold down Shift & Alt on the keyboard you can temporarily disconnect the master from the group in order to change it's level).

- Next assign GTRL as a master of GTRR, and assign the BASS as a master over GTRL and the bass drum (BD). You now have control over the entire backline using just one fader!.

You can also set up standard mute groups in a similar fashion. The next section shows you how to set up two different and extremely useful types of mute groups.

7. Setting Up Toggle Mute Groups

With standard mute groups the slaves always follow the state of the master, i.e. master mute on - all slaves on. A toggle group can be used whenever you need flip one set of mutes on, and another set of mutes off. To set set up mute toggle groups follow this procedure:

- Select **TGROUP** form the control panel or press **H** on the keyboard.

- Click on the status box of channel mute 1. A 'T' will appear in the box showing that it is a Toggle Group master.

- Next click on the status boxes of mute channels 2, 3 and 4. A 'C1' will appear in the status box of each mute channel, showing that they are slaves to mute channel 1.

- Now turn on channel mutes 2 and 4. Then press channel mute 1. Note that pressing the master toggles the states of the mutes in the group.

A possible application for Toggle Groups is as follows. Lets say we are using a synthesiser voice for the verses but are using a totally different voice for the choruses. We can feed the synthesiser into two seperate channels, with seperate EQ & aux send settings appropriate for the two voices. If we assign a **Toggle Group** to these two channels we can simply swap between the two channels, and the different voices, at the touch of a single button for the verse & choruses.

8. Setting Up A Solo Group

A solo group effectively gives you a 'local solo-in-place' anywhere on the console. To set set up a solo group follow this procedure:

- Select **SOLOGRP** form the control panel or press **J** on the keyboard.

- Click on the status boxes of mute channels 1, 2, 3 and 4. The status boxes of each channel will show that it is part of the Solo Group.

A solo group can be useful when you have, say, 4 versions of a guitar break on your multi-track from which you need to make a composite track. Using a solo group will allow you to save various mix options for reference and playback before choosing the final version and erasing the source material.

8. Erasing Events From The Mix

We will now go through the process of erasing a fader move that we made earlier on channel 15.

- Press **ENTER** on the numeric keypad to play back the mix.

- Select ***ERASE*** from the control panel or press **[DEL]** on the keyboard.

- When a move on channel 15 has passed click on the channel fader area. This has marked the current or previous event on the channel for deletion. Hit **CLR/HOME** on the keyboard to delete the event. Select ***ERASE*** again (or **[DEL]**) to exit erase mode.

- When you playback the mix again, the fader move on channel 15 is no longer there.

V5 Automation allows you to delete individual VCA, mute or Patch Recall events, or you can delete all the events associated with a channel. Now delete the fader moves on channel 16 ready for the next section of the tutorial.

9. Editing The Mix In Trim Mode

For the last part of the tutorial we will go through the process of editing a fader move in trim mode. In trim mode fader movements are recorded as additions to the current moves. This lets you make small adjustments to fader moves or to add an offset to all the moves for a particular channel.

To demonstrate Trim Mode, record the following fader moves on channels 15 & 16. Starting at the bottom of the travel, move the fader up to the 0dB position, then down to the -5dB position, then down to the -10dB position. First we'll record a trim on channel 15's fader.

- To put the console into Trim Mode select **RELTVE** from the control panel, or press **V** on the keyboard.

- Next select **NULL** from the control panel, or press **N** on the keyboard, to enter free-null mode. Move the fader up to the 0dB position. Press **N** again to exit free-null mode.

- Press **R** to enter record mode and press **ENTER** on the numeric keyboard to start playing the mix.

- When the VCA starts moving up to the 0dB position, move the fader up to the + 5dB point. When the VCA starts moving down to the -5dB position return the fader back to the 0dB position.

- Press **0** on the numeric keypad to stop recording.

When you play back the mix you will see that the VCA now moves up to the + 5dB point. You have added a 5dB offset to the VCA movement.

Next we'll record a trim on channel 16's fader.

- To put the console into Trim Mode select **RELTVE** from the control panel, or press **V** on the keyboard.
- Next select **NULL** from the control panel, or press **N** on the keyboard, to enter free-null mode. Move the fader up to the 0dB position. Press **N** again to exit free-null mode.
- Press **R** to enter record mode and press **ENTER** on the numeric keyboard to start playing the mix.
- When the VCA starts moving up to the 0dB position, move the fader up to the +5dB point and leave it there.
- Press **0** on the numeric keypad to stop recording.

When you play back the mix you will see that the VCA now has a 5dB offset added to the move you made. If there were any VCA moves further on in the mix, these too would have the 5dB offset added. If you record any new fader moves to the mix (not in trim mode) these moves would not have 5dB added to them.

10. Saving & Loading a Mix

To save your mix, select **Save** from the **File** menu, or press **CTRL-S** on the keyboard. You will then be presented with a selector box, as shown:

This gives you the option to save the various system configurations such as groups, patches, & solo safes. If you select MIX, all of the console settings will be saved.

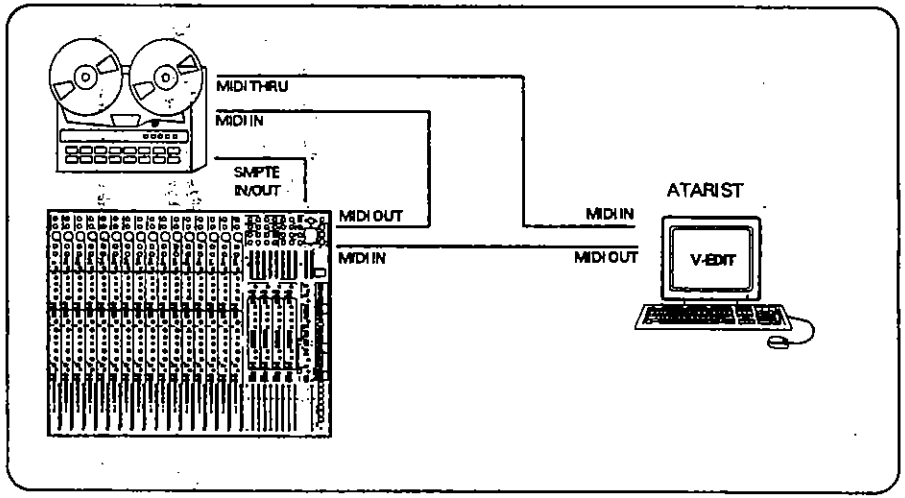
To save the mix, select **MIX** from the option box, or press **1** on the keyboard. You will then be prompted to enter a filename to save your mix under.

To load in a previously saved mix, select **Open** from the **File** menu, or press **CTRL-O** on the keyboard. You will then be presented with a selector box asking you which type of file to load. As with SAVE you can load in an entire mix (with all the associated console settings) or you can load in individual console settings such as patches or groups.

SYSTEM SETUP

Shown below are two typical MIDI system setups upon which you can base your own MIDI setup. It is most important to bear in mind, when setting up your system, that the GS3 & V-EDIT must have 2 way MIDI communication (i.e. GS3 MIDI out to V-EDIT MIDI in, and V-EDIT MIDI out to GS3 MIDI in). All connections shown in the examples are MIDI except where otherwise stated.

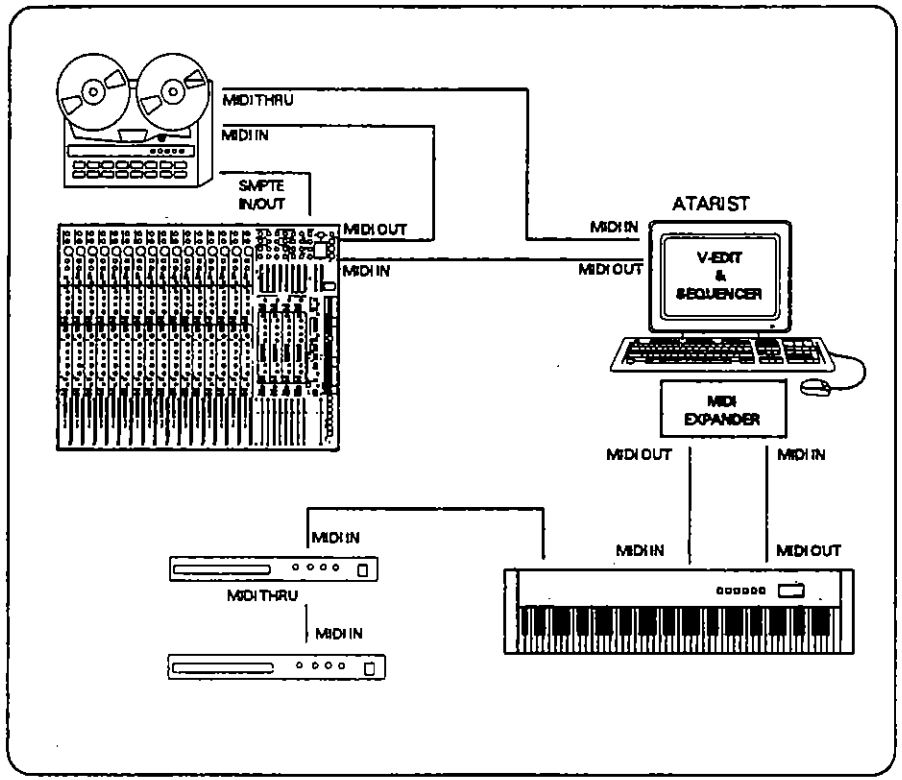
1. GS3 & V-EDIT with Multi-Track Tape Machine



This is the optimum setup consisting of the GS3, V-EDIT and a multi-track tape machine. By 'striping' a track of the tape machine with time code from the GS3's SMPTE module, the automated mix on the console can be synchronised to the music on the tape. This is the only way to synchronise the automation in this setup.

If your tape-machine is MMC (MIDI Machine Control) compatible, using the above configuration allows you to control the tape transport from the console's Function Keys. Otherwise connect the MIDI out from the GS3 directly to the MIDI in of the Atari ST.

2. GS3, V-EDIT and Multi-Track with ATARI based Sequencer



This setup shows the GS3 and V-EDIT in a typical MIDI setup with a sequencer, MIDI keyboard & expanders. The sequencer can run alongside V-EDIT on the Atari using either M-ROS or Softlink. It is recomended that you use seperate MIDI ports for your console & synthesizer MIDI data by using a MIDI port-expander device.

In this configuration the console gets it's sync from the tape-machine via the SMPTE module. The console will then output MTC to the Atari where it can be used to synchronise the sequencer (the console must have Mode 12 MTC Output enabled. See the section on Modes).

If your MIDI port-expander device includes a SMPTE reader, you can also connect the SMPTE output from the tape-machine to it.

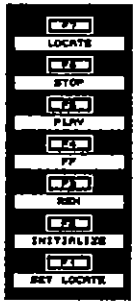
INTRODUCTION

Function keys are essentially programmable MIDI switches which can be set up as desired. Applications for Function Keys are as follows:

- If your tape machine can transmit and receive MIDI, you can use your function keys as a second set of transport controls located to hand on the console.
- You can use your function keys to control any other MIDI compatible outboard equipment (e.g. sequencers, synthesisers, effects processors, etc.)
- You can use your function keys to recall specific mute or VCA patches on the console.
- You can use your function keys to toggle a specific set of mutes (mute presets).

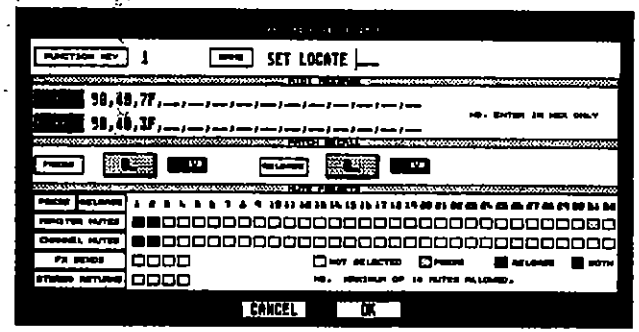
Note that your old footswitch socket is no longer tied to Function Key 7.

Seven Function Keys are provided on your GS3 console and also in V-EDIT. To view your function keys in V-Edit go to the Master Page (page 4) by pressing key 4 on the keyboard. The function keys appear as shown:



To activate the Function Key simply click on the button icon. This is identical to pressing the Function key on the console. To programme the a Function Key click on the Name Box below the Function Key button icon. The dialog box shown below will appear.

The seven Function Keys are duplicated on the Atari keyboard as function keys F1 - F7.



FUNCTION KEYS AS TAPE MACHINE TRANSPORT CONTROLS

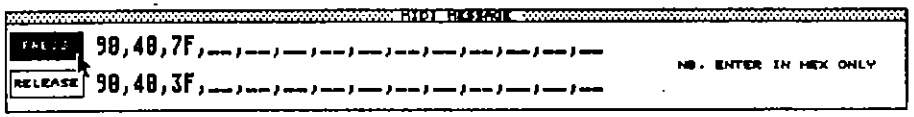
The Function Keys are factory programmed for transport control of MIDI Machine Control compatible tape machines. The most commonly used tape transport commands have been selected and programmed on the function Keys. If you have an MMC based tape machine (e.g. Fostex R8) you may decide to mark the the function key write-on strip with the corresponding tape transport commands shown above.

The function keys provide for key press and release MIDI messages. The above factory defaults only use the key press MIDI message. It is possible to cascade two MMC commands for press and release on one key, e.g for Rewind and Stop.

NAMING A FUNCTION KEY

To change the name of a Function Key, click in the NAME field of the Function Key Editor box as shown above. Type in the new name and click on the OK box.

PROGRAMMING A MIDI MESSAGE INTO A FUNCTION KEY



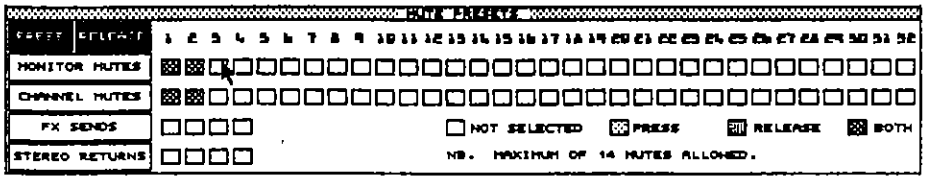
A MIDI message up to 14 bytes long can be assigned to both the press & release action of a Function Key. To programme a MIDI message into a Function Key, first click on the PRESS box to activate a MIDI MESSAGE PRESS. Then type in the MIDI message in hexadecimal format. Follow the same procedure for the RELEASE action.

The MIDI message can be MMC type messages for controlling MIDI based tape machines, or Note/ Program Change messages for controlling samplers, effects processors or sequencers.

PROGRAMMING A PATCH RECALL INTO A FUNCTION KEY

A Patch recall can be assigned to a Function Key for either press or release. To programme a Patch recall first click on the PRESS box, then click in the PATCH NUMBER box and type in the required Patch Number. Then click on the attribute box to select the desired Patch attribute. Programme the RELEASE patch recall in a similar fashion.

PROGRAMMING MUTE PRESETS INTO A FUNCTION KEY



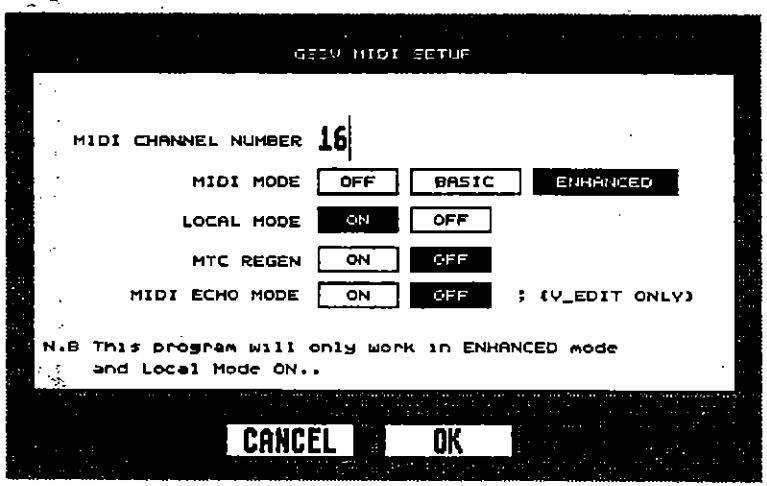
A mute preset is different from a Patch in that it toggles the state of the mutes in the preset, wheras a Patch affects every mute on the console. Mute presets can be set up for PRESS and RELEASE of the Function Key. To programme a PRESS Mute preset first click the PRESS box. Then click on the mute boxes to select the mutes required. Follow the same procedure for RELEASE.

INTRODUCTION

Console modes are used to configure the automation to suit your particular setup and are accessed through the MODES menu in the menu bar. There are two MODES menus- **MIDI Modes** which affect the way the automation uses MIDI - and **Console Modes** which affect certain console settings.

MIDI MODES

To access the MIDI Modes menu, select **GS3V MIDI** from the **Modes** menu, or press **CTRL- M** on the keyboard. The following window will appear. Simply click on the boxes to select the desired Mode.



MIDI CHANNEL

The default MIDI channel is **16**. To change the MIDI channel type in the new channel number

MIDI MODE

Enhanced
This is the default MIDI mode and is the usual mode for system operation. This mode enables the console to communicate MIDI automation information at it's full potential, providing the maximum 11,700 step VCA resolution, and can utilise the full range of facilities on V-EDIT.

Basic
In Basic mode the console transmits standard MIDI information that is not specific to the automation system. This mode can be used if the console is being used with MIDI sequencer equipment that does not interface to the console automation.

Off
This mode is provided for use with the GS3V console only. DO NOT USE THIS MODE.

LOCAL MODE ON/OFF

The default mode is Local Mode ON. If Local Mode is off the console automation MIDI information will be transmitted but will not affect the console settings unless they are echoed back via another MIDI device.

MTC REGEN ON/OFF

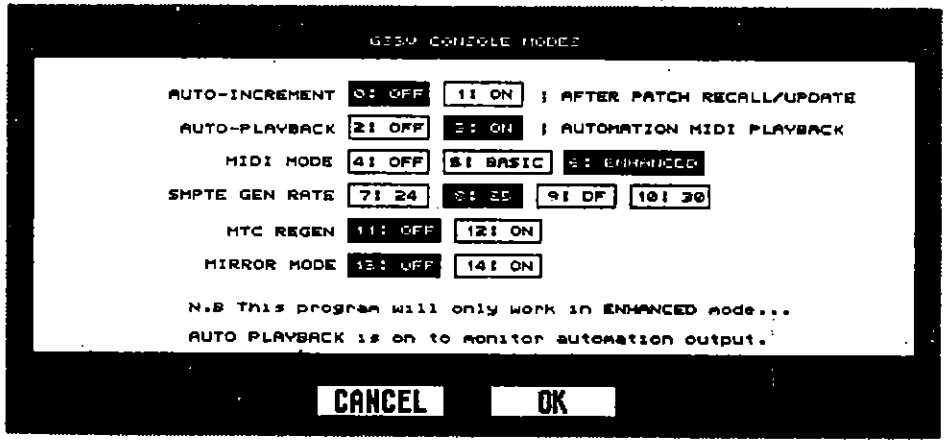
The default mode is Regen On. With Regen Off, if MTC (Midi Time Code) is received by the console on MIDI IN, or if the console is reading SMPTE time code, it will not be transmitted from MIDI OUT of the console. This mode helps to reduce the amount of MIDI data being transmitted from the console. However, in this mode the Time Code display on V-EDIT will not operate. If you want the time code display to operate, or if another piece of equipment in your setup needs to receive MTC, then turn MTC Regen ON.

MIDI ECHO MODE ON/OFF

The default mode is OFF. When MIDI Echo is On any MIDI data received by V-EDIT at the MIDI IN port will be echoed to the MIDI OUT port, with the exception of MIDI System Real Time Mesages such as MTC, and MIDI Clocks. Note that Echo Mode On canot be used when running under MROS or Softlink.

CONSOLE MODES

To access the Console Modes menu, select **GS3V Console** from the **Modes** menu, or press **CTRL - C** on the keyboard. The following window will appear. Simply click on the boxes to select the desired Mode.



AUTO-INCREMENT ON/OFF

The default mode is OFF. With Auto-increment On, the Patch number will automatically increment to the next Patch number every time a Patch is recalled. This feature is useful for scrolling through Patch scenes in sequence.

AUTO-PLAYBACK ON/OFF

The default mode is ON. When Auto-playback is OFF the console will not output automation MIDI data when playing back a mix. The console itself will perform the mix but it will not be visible on V-EDIT.

MIDI MODE

Refer to MIDI Mode menu on previous page.

SMPTE GEN RATE

Your GS3 V5 Upgrade console has been fitted with a SMPTE Reader/Generator. This option allows you to select the required frame rate for the SMPTE generator used to stripe your tape. The default frame rate is 25 frames per second. Refer to the section on SMPTE for more information.

MTC REGEN ON/OFF

Refer to the MTC Regen menu on the previous page.

MIRROR MODE ON/OFF

The default mode is Mirror Mode ON. With mirror mode ON the console will always 'mirror' the state of V-EDIT when using the programing modes (Group, Toggle Group, Solo Group & Isolate). With Mirror Mode OFF the console does not follow V-EDIT when using these modes. This is to allow programing to be done 'in the background'. For example, you could set up groups on V-EDIT while the console is playing back a mix.

SMPTE MODULE

INTRODUCTION

If you have a multi-track tape machine in your setup, you can synchronise it to the console's automation system using the internal SMPTE reader/generator. Your old footswitch socket above the MIDI sockets on the console is now a SMPTE IN/OUT socket. The SMPTE generator is controlled from V-EDIT. The SMPTE reader requires no configuration & automatically detects the frame rate being used. When synchronised to SMPTE timecode the console will output MIDI Time Code if MTC Regen Mode is turned On (see the section on Modes).

SPECIFICATION

FRAME RATES:

READ ..... 24, 25, 30 & Drop Frame

GENERATE ..... 24, 25, 30 & Drop Frame

SIGNAL LEVELS:

INPUT OPERATING RANGE .. -30dBV to 20dBV

OUTPUT LEVEL ..... -16dBV

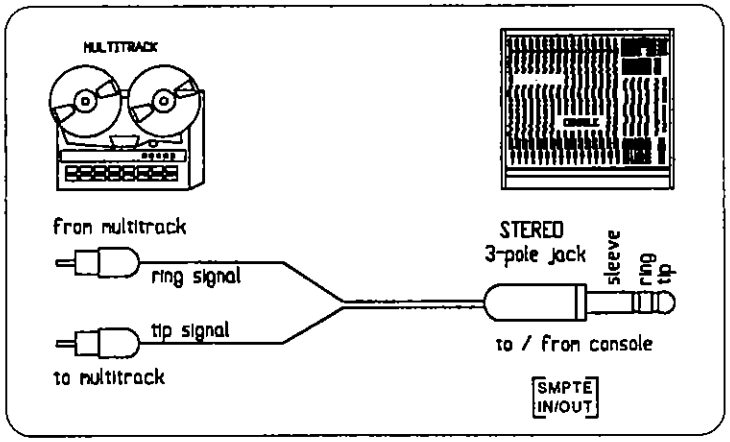
TAPE SPEED SYNC RANGE ..... +/-1 Octave

DEFAULT SETTINGS:

FRAME RATE ..... 25 frames per second.

GENERATOR START TIME 00.00.00.00

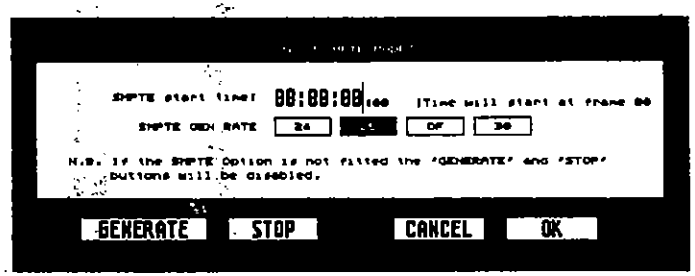
GETTING STARTED



You will need to wire up a lead to connect the tape **IN** and **OUT** of your tape machine to the stereo 1/4" jack **SMPTE IN/OUT** on the console as shown above.

STRIPING THE TAPE

The first thing to do is to 'stripe' your tape. This involves recording SMPTE timecode onto a track (usually an outside track) of your multi-track recorder. Select **SMPTE Option** from the **Utilities** menu in the menu bar, or press **S** on the keyboard. The window shown below will appear:



SMPTE Start Time

First set SMPTE start time. Do this by typing in the required start time. Any illegal values (e.g. 99 hours) will be reset to zero after clicking the OK button. The default start time is 00.00.00.00. The frame value always starts from 0 frames. The start time you enter will be remembered by the console until you change it.

SMPTE Frame Rate

Next select the desired frame rate by clicking the mouse in the appropriate box. This can also be accomplished using the Console Modes menu. The default frame rate is 25 frames per second. The frame rate you enter will be remembered by the console until you change it.

Recording Time Code

Set your tape machine to record and run the tape. Start the time code generator by clicking on the GENERATOR button. When you have recorded time code on the whole length of the tape stop your tape machine. Stop the time code generator by clicking on the STOP button.

SYNCHRONISING TO SMPTE

When you play the tape the console will automatically synchronise to it. The SMPTE reader will automatically detect the frame rate being used when the tape is first run after the console is powered on. If you are using different frame rates in a session you will need to invoke the frame rate auto-detection for the new frame rate. This can be done in a number of ways:

1) Erasing the current mix
2) Running the time code generator for a few seconds
3) Temporarily removing the console power for a few seconds.

IMPORTANT NOTES

Synchronisation

If you have recorded a mix using SMPTE time code for synchronisation, you cannot then synchronise the mix using either MTC or MIDI clocks, & vice versa.

Ground Path

The SMPTE module relies on getting it's ground signal from the audio channels. For the SMPTE module to operate you MUST have at least one audio channel connected to your tape machine, apart from the SMPTE lead.

TECHNICAL DESCRIPTION 1

The **GS3** range are flat panel in-line monitor format compact audio recording consoles with a separate **MPS9** power supply unit. The standard **GS3** includes mute switch automation. The **GS3V** includes both VCA fader automation and enhanced mute switch automation. The **GS3** can be upgraded with the **V5 VCA Automation Upgrade kit**. This allows a standard GS3 to be fitted with the GS3V automation. This gives the GS3 all of the automation capabilities of the GS3V except for the following:

- there are no Event or Null LEDs next to the faders.
- the automation is controlled using the V-EDIT program on an Atari ST computer.

16 and 24 Channel versions of each are available as well as the 8 channel **GS3-X8** and **GS3V-X8** to expand the console to a maximum of 32 channels. It benefits from the latest technology and manufacturing techniques as well as ALLEN & HEATHs experience and dedication to the design of high performance audio mixers for professional users. The specification matches that of consoles costing many times the price.

THE MECHANICS The construction comprises a flanged steel front panel which slots into purpose designed extruded aluminium sections which form the front armrest and rear cross member. The plastic finish Medite side trims bolt on to these with sturdy M6 hex head bolts. The trims are strengthened by internal steel brackets which connect them to the base. The flat steel base is screwed in place to the armrest, rear member and side brackets using 6AB cross head screws and may be removed for service access. Multiple internal printed circuit assemblies interconnect by means of plug-on connector harnesses for easy circuit assembly removal.

THE CIRCUIT COMPONENTS GS3 audio consoles are manufactured using high quality industry standard linear op-amp, logic gate, discrete semiconductor, and microcomputer circuit designs. There are no electro-mechanical relay contacts in the audio signal path. When operated correctly the normal performance of the console introduces negligible audio signal degradation.

THE POWER SUPPLY The console has a universal low noise, regulated DC power supply unit for all amplifiers, logic and indicator subsystems. External power supply type MPS9 operates from single phase 50/60Hz AC mains input and provides the three regulated DC outputs required for console operation: +16V, -16V, +48V DC. The ±16V supplies are filtered into separate feeds for the audio and indicator/logic circuits The internal computer system uses the +16V DC supply regulated within the console to +5V DC. The power unit transformer is internally wired for the required 100, 110, 220, or 240 V.AC mains.

CALIBRATION Normal operation does not require any internal adjustment or calibration. A single preset adjusts the bargraph meter '0' level. On GS3V consoles and GS3 consoles that have the V5 VCA upgrade installed, each channel VCA includes a preset to trim for minimum harmonic distortion. These presets are factory set.

AMPLIFIER BIASING Audio amplifiers are supplied with ±16V DC and all are centre biased types having negligible offset voltage at input and output terminals. This offset voltage is typically less than 1V with respect to chassis (0V DC).

CONTROL CLICKS The potentiometers, faders and switches are isolated where necessary from the residual DC offset by coupling capacitors. Appearance of loud clicks and crackles during control operation is a fault symptom. Switching +48V phantom power with the fader raised however is not recommended as this may cause an audible click due to the high amplification of the mic pre-amp stage.

AUDIO INPUTS The microphone inputs are electronically balanced (differential), and all line level inputs are unbalanced. Mic input impedance is less than 2k ohm, and Line inputs are greater than 5k ohms.

AUDIO OUTPUTS These are unbalanced as standard. Output impedances are low, to drive loads down to 2k ohms, and are thus capable of driving several high impedance line inputs simultaneously.

PHASE All audio inputs and outputs are in-phase except for the inserts which are phase reversed.

THE PFL SYSTEM The channel PFL switches send pre-fade audio signal to the console PFL mix buss. This is switched within the control room monitor circuit on the MASTER PCB by 4053 CMOS gates (between op-amp stages) biased from a ±7.5V DC supply which is generated locally from the ±16V supply. These gates are switched from the selected monitor source to the PFL signal when the console PFL DC buss is switched to logic 0V by the PFL switch.

THE BARGRAPH METERS The GROUP outputs are fed to the BARGRAPH METER PCB via a 16 way ribbon harness from the MASTER PCB. The meter circuit rectifies and filters these signals to DC voltages which drive the 10-segment bargraph columns. The filter component values determine the attack and decay characteristics of the meter response which is set for QUASI-PEAK (as on many popular multitrack machines). Calibration is by one factory set preset which adjusts the level of all eight meters simultaneously.

THE AUTOMATION SYSTEM

GS3 Series consoles have internal microcomputer controller / real-time sequencer systems which provide comprehensive automation of the fader levels and/or mute switches. Whilst able to communicate and interact with external studio sequencers, computers and MIDI equipment they are not dependant on these to control the console automation. The console computer provides a memory system for storing patch, song and configuration data, and has a MIDI interface for communicating data with external equipment, and a footswitch interface.

Standard **GS3** consoles are programmed with the ALLEN & HEATH **V4** automation software for mute switch control. **GS3** consoles that have the V5 VCA upgrade installed and **GS3V** consoles have **V5** software for mute switch and fader level control.

HOW THE MUTES ARE CONTROLLED The console mutes are electronically controlled by the microcomputer which scans and reads each momentary action MUTE SWITCH and returns control signals to each channel AUDIO MUTE ELEMENT (circuit) to toggle the audio signal (and indicator LED) on or off. The computer multiplexes mute control logic via a 16 way ribbon harness to and from plug-on SLAVE PCBs (one per four channel strips) which in turn demultiplex control signals to and from the mute elements on each IO CHANNEL and GROUP PCB.

THE AUDIO MUTE ELEMENT The audio switch is a special design of electronic solid state switch, developed through a range of successful ALLEN & HEATH products. It uses a field effect transistor (FET) having a practically infinite operating life and very low power consumption. It is operated by a DC control voltage received via the SLAVE circuit from the internal microcontroller. Conditioning circuitry ramps and filters the control voltage to prevent audible clicks. Operation introduces negligible degradation to the audio signal. In particular, noise, control feedthrough (click), harmonic distortion and "shut off" are excellent. A high performance n-channel FET is used, requiring a negative gate "pinch-off" voltage to mute the audio signal.

HOW THE FADER LEVELS ARE CONTROLLED (GS3V & GS3 V5 VCA UPGRADE) The audio faders are replaced with high performance voltage controlled amplifier (VCA) circuits. The faders themselves send DC voltages determined by the fader positions to the internal microcomputer which in turn sends control voltages to the VCAs to set the audio level. These control voltages are mutiplexed via two 16 way ribbon harnesses between the fader SLAVE PCBs (one per 8 channel strips), the KEYBOARD PCB and V-MICRO PCB back to the CHANNEL VCA PCBs (one per 8 channel strips). On **GS3V,** user indication is provided by the three LEDs beside each fader to indicate event and null status. **GS3** consoles that have the V5 VCA upgrade installed do not have the LEDs fitted and consequently user indication is via V-EDIT on the ATARI ST computer.

THE STANDARD GS3 MICROCOMPUTER The GS3 computer system is based on the 8032 microcontroller which reads instructions from the plug-in 16k byte EPROM. This is programmed with the ALLEN & HEATH GS3 **V4** software (indicated by the self adhesive label). Mute and console configuration data is stored in an 8k byte battery backed RAM memory. This battery is trickle charged when the console is powered and should retain the memory for several months with the console switched off. The footswitch and MIDI IN connections are opto-isolated. MIDI THRU and OUT are buffered. The computer and control keypad are mounted on the MICRO PCB which plugs into the BARGRAPH METER PCB which contains the 2-digit 7-segment LED displays and decoders.

THE GS3V MICROCOMPUTER The GS3V computer system is based on the powerful 80C517A microcontroller which reads instructions from a 64k byte EPROM. This is mounted in the removable top panel V-PROM module. It is programmed with the ALLEN & HEATH **V5** software. Fader level, mute and configuration data is stored in a 128k byte battery backed RAM memory. The V-PROM module also houses the optional SMPTE READER/GENERATOR which uses the panel mounted 3-pole SMPTE jack socket. A 12-bit DAC converts the digital signals to analogue fader control voltages. The computer circuit is mounted on the small V-MICRO PCB with mostly surface mount components. The separate KEYBOARD PCB contains the control switches as well as the L-R master VCA circuits It also distributes the logic signals to the FADER SLAVE and CHANNEL VCA PCBs via the 16 way ribbon harnesses.

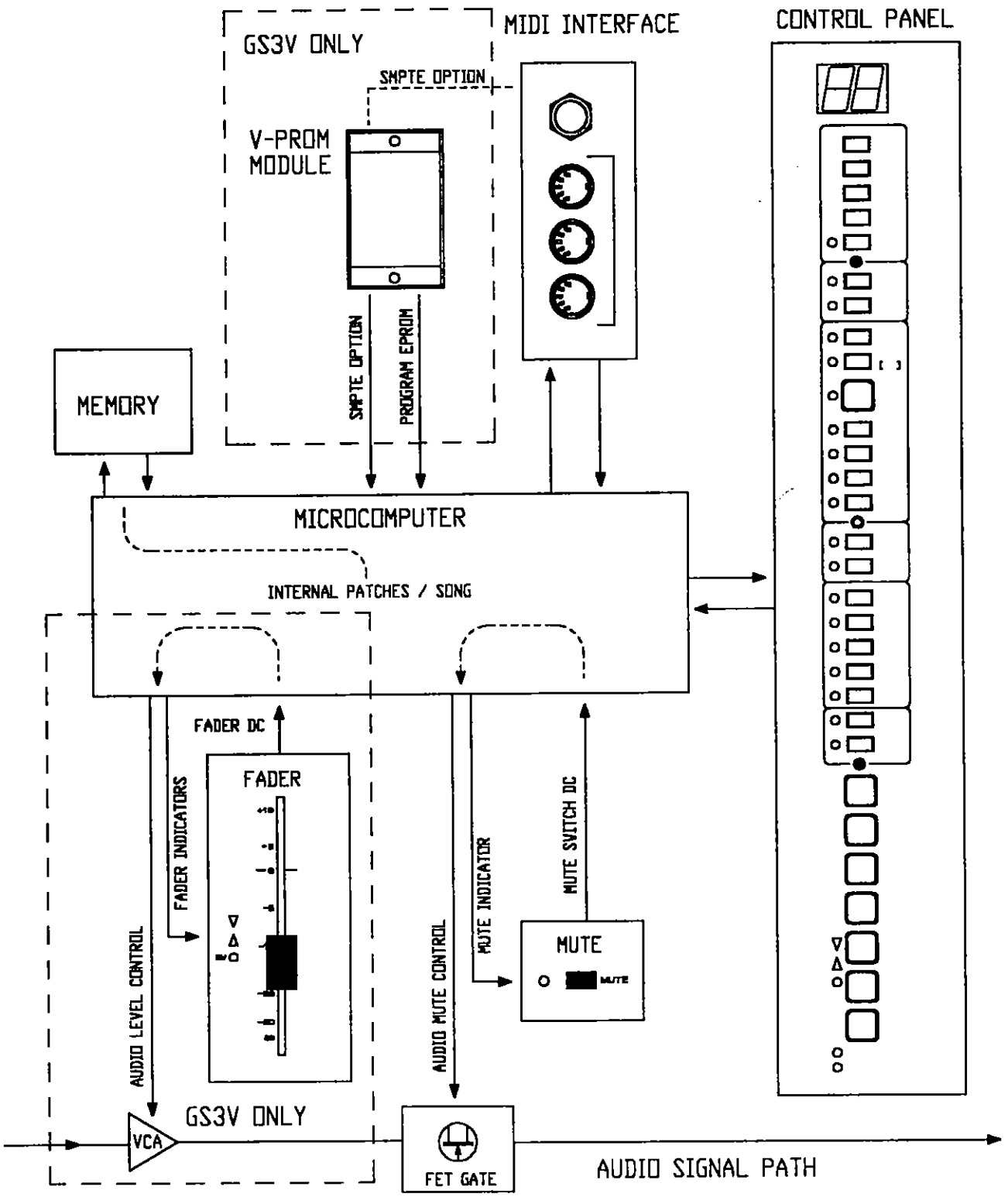
THE GS3 V5 VCA AUTOMATION UPGRADE From the point of view of the GS3 owner, an upgraded console will be the same as a standard GS3 except for the following:

- The footswitch socket above the MIDI sockets on the console becomes a SMPTE IN/OUT socket. The footswitch function is no longer available.
- The automation control keys are replaced with 7 Function Keys.
- The Left & Right master faders are replaced by a single stereo L/R master fader.

The upgraded GS3 uses the same microcomputer assembly as the GS3V but because there is no V-PROM compartment the V-PROM and SMPTE PCBs are mounted on the rear of the BARGRAPH METER PCB.

The GS3 series Automation system

Note: the control panel shown below is for the GS3V.



SERVICE NOTE

Correctly installed and operated, the **GS3** and **GS3V** consoles should continue to function with optimum performance without the need for internal adjustment, calibration or maintenance. Several stages of rigorous quality testing are applied during manufacture of this product, and high quality long life components are used throughout to ensure continued reliable operation. As may be expected, mechanical controls and connectors may wear in time with repeated use. In our experience it is typical that just the faders may require replacing during the normal lifetime of the console.

Access to the internal assemblies should only be required if you need to change one of the configurable options, add on an 8-channel expander, upgrade a GS3 with V5 VCA AUTOMATION or replace a worn component such as a fader. If the console has been subject to excessive mishandling or abuse, or a fault is reported, you may need to carry out fault diagnosis and repair. Please refer to the section : *TROUBLESHOOTING* for further guidance on fault finding methods.

The design of this console allows quick access to, and easy replacement of components and assemblies. The basic servicing procedures are detailed later in this section.

SAFETY

Mains electricity is dangerous and can kill. Mains voltage is present within the power unit but not the console itself. Check your mains wiring and earthing arrangements before switching on.

The engineer carrying out the service work must be familiar with and competent in handling audio equipment, mains wiring and earthing.

GOVERNMENT AND INSURANCE UNDERWRITERS ELECTRICAL CODES MUST BE OBSERVED. These codes take precedence over any suggestions in this manual!

LOOKING AFTER YOUR CONSOLE

The following are the simple precautions we recommend to preserve the working life of the console (as printed in the OWNER MANUAL):

CLEANING Use only a clean damp cloth and soft brush. Avoid the use of chemicals, abrasives and solvents.

LUBRICATION The faders, switches and potentiometers are lubricated for life. The use of electrical lubricants on these parts is not recommended.

DIRT AND DUST Protect the console from excessive dirt and dust to prevent damage to moving parts such as the faders and potentiometers.

MOISTURE Protect the console and power supply from moisture and condensation. If either becomes wet, switch off the power supply immediately, allow the equipment to dry out, and have it checked for satisfactory performance by a qualified technician.

GENERAL SERVICE PRECAUTIONS

- We stress the need for careful handling of the console and its internal assemblies. Advanced, highly compact printed circuit assemblies are linked by press-on IDC (insulation displacement connector) harnesses and dedicated wiring looms. Several of these assemblies plug directly on to other assemblies.

- Make sure that you correctly align and press home the connectors and assemblies after carrying out service work.

- We suggest that you develop tidy and methodical working routines to prevent problems due to lost parts or missed procedure stages.

- Work on a suitably sized, clean work surface which is clear of parts or debris which may damage the console cosmetics.

- Remove all dirt and debris such as solder, component legs and wire clippings from inside the console, and check your work carefully before replacing the base.

- Test the reassembled console for correct operation.

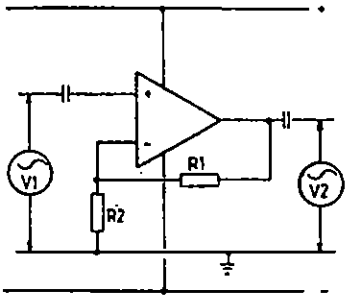
- If the console is to be sent by carrier we advise that you check the packing for suitability first. Use the purpose designed ALLEN & HEATH packing if it is not damaged and still intact.

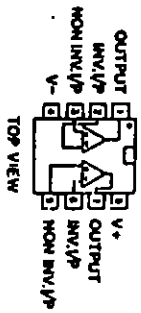
- Log the service work carried out. If applicable use the field service report forms copied from the following pages.

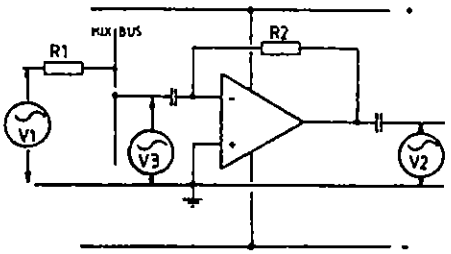
AUDIO AND DC MEASUREMENTS

A general purpose professional quality analog or digital multimeter is recommended for measuring DC voltages, current, component resistances etc. We recommend a meter of 20,000 ohms/V or greater to prevent false readings due to circuit loading. Use shrouded probes to prevent accidental short circuiting of nearby assemblies. A general purpose oscilloscope is an invaluable aid to probing and locating faults. For more advanced audio performance measurement you shall need an audio bandwidth sinewave oscillator (20Hz to 20kHz), and a microvoltmeter capable of reading decibels (dBu or dBm). There are several purpose designed audio test sets available which include a combined oscillator and meter and are ideal for the measuring audio level, frequency, noise and distortion.

If you wish to relate your measurements to the published specification make sure that you understand and simulate the original measurement conditions. For example, we measure rms noise performance with a 20Hz to 20kHz bandwidth referenced to 0VU i.e. the difference between the normal operating level (0 on the meters) and the noise floor. Distortion is measured as THD + noise (total harmonic distortion + residual circuit noise).







Non-inverting amplifier
GAIN = V2 / V1 = 1+ R1 /R2
dB = 20log(GAIN)

Inverting amplifier
GAIN = V2 / V1 = R2 / R1
dB = 20log(GAIN)
V3 = approx V2 / 10,000 = near 0V

V2 max = +21dBu = approx 10Vrms (28V p-p)

REPORTING A PROBLEM TO ALLEN & HEATH

We are happy to offer comprehensive technical support to assist you with problems or queries relating to our product range. We also welcome customer comment and feedback to help us provide the products and features you want. We have a network of APPROVED SERVICE AGENTS to assist the customer direct and carry out the service work required. Our TECHNICAL SERVICES DEPARTMENT is able to provide telephone or on-site support as necessary to these agents or to customers referred by their agent.

So that we may provide an efficient service we request that all service calls are supported with the relevant console details. A blank copy of both sides of the service form is included here for you to PHOTOCOPY and log the important details. Please quote this information when requesting assistance by telephone.

FIELD SERVICE REPORT Use this form when reporting service work carried out, or field service comments.

ALLEN & HEATH QUALITY ASSURANCE FIELD SERVICE REPORT.

When completed, this form is to be forwarded to:

Allen & Heath Ltd. Quality Control Dept.
Kernick Industrial Estate, Penryn. Cornwall. TR10 9LU.
Tel: 0326 372070 Fax: 0326 377097

All reports received will be used for internal quality auditing purposes. A copy must accompany any returned products.

Part 1 CUSTOMER FAULT REPORT

Customer Name: _____

Product: _____ Serial No: _____ Date Purchased: / /

Dealer: _____

Customer Fault Description: _____ Date: / /

Part 2 TECHNICIAN REPORT

Compiled by: _____ Date: / /

Contact Telephone No: _____ Company: _____

Address: _____

CONSOLE INOPERATIVE: TOTALLY ❑ PARTIALLY ❑

FAULT NATURE: PERMANENT ❑ INTERMITTENT ❑

FAULT LOCATION: CHANNEL ❑ GROUP ❑ MASTER ❑ MPC ❑ PSU ❑

FAULT COMMENT: _____
continue overleaf if necessary _____
_____

CAUSE:

COMPONENT: INCORRECT VALUE ❑ NOT FITTED ❑
INCORRECT FIT ❑ FAILURE ❑

SOLDERING: SHORT ❑ PCB ❑
DRY JOINT ❑ WIRE ❑

HARNESS: FAULTY CONNECTION ❑ INCORRECT FIT ❑

FUSE BLOWN: ❑ TYPE & VALUE: _____

MECHANICAL: METALWORK ❑ PCB ❑

INDETERMINATE: CONSOLE ❑ PSU ❑

OPERATOR: ❑ Comments: _____
_____

OPERATING CONDITIONS: HIGH TEMPERATURE ❑ HIGH HUMIDITY ❑

ITEM(S) BEING RETURNED: YES ❑ NO ❑ OTHER ❑

FOR: REPAIR & RETURN ❑ REPLACE ❑

P.T.O.

ADDITIONAL COMMENTS ON FAULT. see overleaf

Part 3: FOLLOW UP ACTION (To be completed by Allen & Heath)

Defect Reference: _____

SERVICE ACCESS

To gain access to the internal assemblies you need to remove the flat steel base. Most service work and module replacement can be carried out without removing the side trims, extrusions or front panel. The exception is access to the computer assembly for EPROM replacement or footswitch option setting. The GS3 requires only that you remove the right hand side trim and not the base. For the GS3V however; the EPROM can be replaced by simply removing the V-PROM cover plate on the front panel. (see section on EPROM REPLACEMENT)

NOTE: Do not remove both side trims at the same time. This may cause the front panel assembly to spring out of the front and rear extrusions.

Please observe the GENERAL SERVICE PRECAUTIONS listed earlier in this section. To remove the base:

1. Disconnect the power supply and all cables from the console.
2. Place the console upside down on a suitable flat surface.

PRECAUTIONS: Make sure that your work surface is clear of dirt and debris which may damage the control knob finish. It is best to place a clean table cloth or foam sheet over the work surface first. Avoid balancing the console on one of its corners as this may damage the trim.

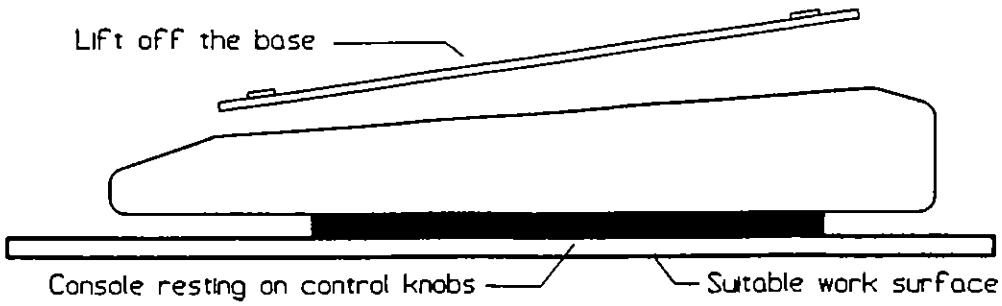
3. Remove the front, rear and side base screws using a 2-point crosshead (Pozidriv) screwdriver. Lift off the base. It may be necessary to prise up the rear of the base using a small flat screwdriver.
4. Carry out the work required.
5. Check the accuracy of your work and connector alignment before replacing the base. Remove all solder debris etc. Make sure that the circuit assemblies and plug-on harnesses are correctly seated.

NOTE: If you have had to remove any circuit assembly cable tie supports such as may be fitted to the SLAVE assemblies, please replace these as previously fitted.

6. Refit the base. Note the correct orientation, ie. the foam tape strip lines up with the SLAVE assembly positions.

PRECAUTION: Do not overtighten the base screws. These self tap into the aluminium extrusions and steel side brackets.

7. Reconnect the power and cables and test for correct operation.



FADER REPLACEMENT

One or more of the faders may need replacing if they have been subject to extensive mechanical wear, or to operator misuse such as having liquids or ash spilled in them. We do not recommend the use of electrical contact lubricants or sprays which may shorten their working life further. Check the condition of all the faders as it may be worth replacing the full set in one go if they are generally worn. Fader replacement is simple, and the parts are not costly.

To change a **Channel** fader on the **GS3V**, refer to the section GS3V - FADER REPLACEMENT.

To replace a fader:

1. Pull the knob off the suspect fader.
2. Disconnect the console, position it upside down on a suitable clean work surface, and remove the base as detailed earlier. Overhang the front of the console to access the fader mounting screw positions.
3. Identify the suspect fader and desolder the three connection wires soldered to its tags.
4. Use a 1-point crosshead screwdriver to remove the two fader screws.

PRECAUTION: Depending on the fader type, 3mm long M3 clearance spacers may be fitted to these two screws between the front panel and the fader body. Take care not to lose them.

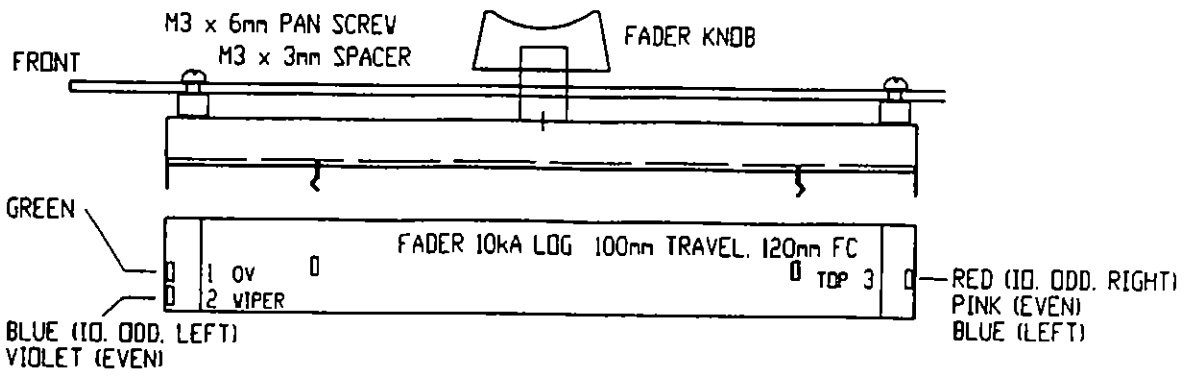
5. Fit the replacement fader with the screws supplied (or the original screws if none are supplied) and the pillars (if required).

PRECAUTIONS: Make sure that the fader is correctly orientated. If it is fitted the wrong way round it will not function correctly. Do not fit longer screws as these may cause the fader to jam before the end of its travel.

6. Solder on the three wires to the correct tags. These are numbered. Re-tin the ends of the wires with new solder to ensure reliable joints.
7. Carefully press on the fader knob.

PRECAUTION: Do not apply excessive pressure when pressing on the fader knob as this may cause the fader body to spring apart.

8. Remove any debris, check your work and refit the base.
9. Reconnect the console and test for correct operation.



GS3V - CHANNEL FADER REPLACEMENT

On the GS3V, the **Channel** faders are soldered onto Fader Slave PCBs (8 per PCB) and mounted under the front panel. Thus if you need to replace a fader, you may want to consider replacing all 8 faders on the PCB. The faders are grouped 1 to 8, 9 to 16 etc, on the PCBs. To replace a fader:

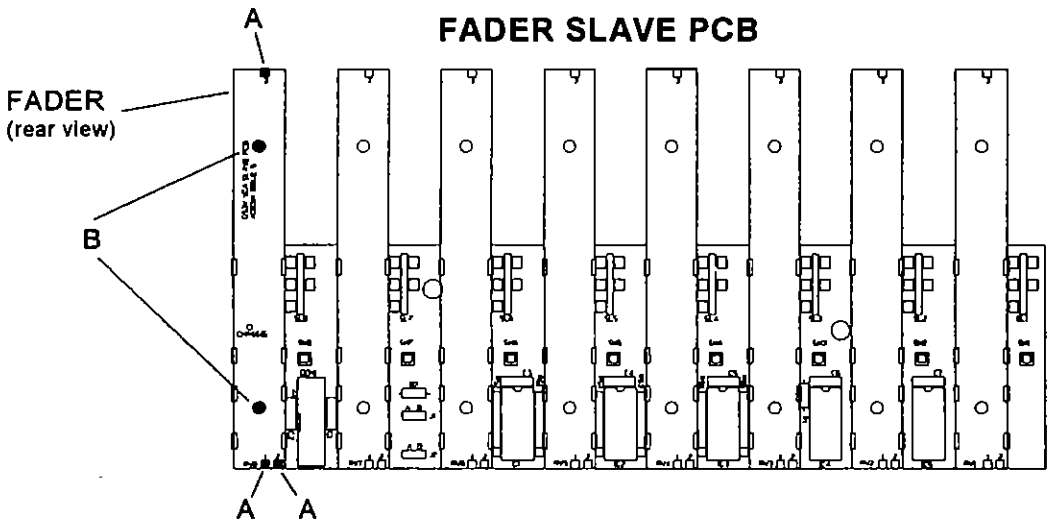
1. Pull the knobs off the group of faders containing the fader(s) to be replaced.
2. Disconnect the console, position it upside down on a suitable clean work surface, and remove the base as detailed earlier. Overhang the front of the mixer to access the fader mounting screws.
3. Remove the two side trims using a 4mm Hex key and then remove the front extrusion by unscrewing the nuts fixing the Headphone and Footswitch sockets.
4. Remove the two IDC harnesses from the VCA & Fader Slave PCBs.
5. Use a 1-point crosshead screwdriver to remove the 2 screws mounting the VCA Slave PCB on the Fader Slave PCB.
6. Unscrew the 16 mounting screws retaining the Fader Slave PCB to the front panel. The Fader Slave PCB can now be carefully lifted from the console.

PRECAUTION: Take care not to bend the LEDs mounted on the PCB as this will make the refitting of the PCB more difficult.

7. Desolder the 3 tags (A) at the edge of the PCB, and the 2 tags (B) towards the centre of the fader.
8. Carefully bend out the 3 tags (A) at the edge of the PCB and remove the fader.
9. Secure the new fader in place by bending the tags (A) and soldering them to the PCB.
10. Solder the 2 tags (B) in the centre of the fader.
11. Repeat steps 6 to 9 for any other fader(s) that need replacing.
12. Carefully locate the PCB in the console. Check the location of the triangular LEDs in the front panel and tighten the 16 mounting screws. Then replace the VCA Slave PCB and the two IDC harnesses.
13. Refit the consoles's front extrusion and fit the two side trims. Remove any debris, check your work, then refit the base.
14. Position the console the right way up and **carefully** press on the fader knobs.

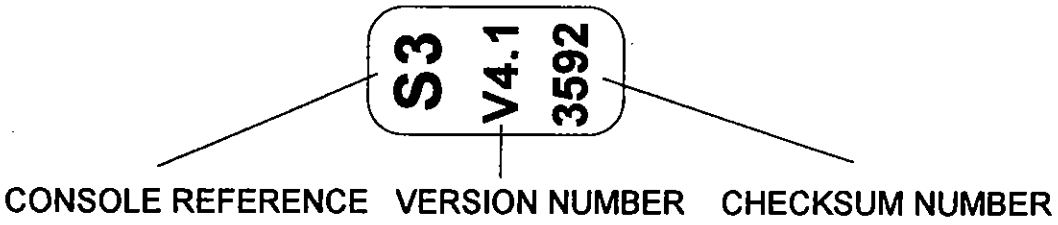
PRECAUTION: Do not apply excessive pressure when pressing on the fader knobs as this may damage the faders.

15. Reconnect the console and test for correct operation.



GS3 EPROM REPLACEMENT

The software that runs the V4 plus MUTE AUTOMATION is programmed by ALLEN & HEATH into a 128k byte EPROM. This is a 28-pin integrated circuit (IC) which plugs into an IC socket on the component side of the MICRO circuit assembly. You may identify it easily as it has a self adhesive label identifying the version number, for example:



Please quote the version and checksum number, as well as the console serial number when discussing the EPROM with ALLEN & HEATH.

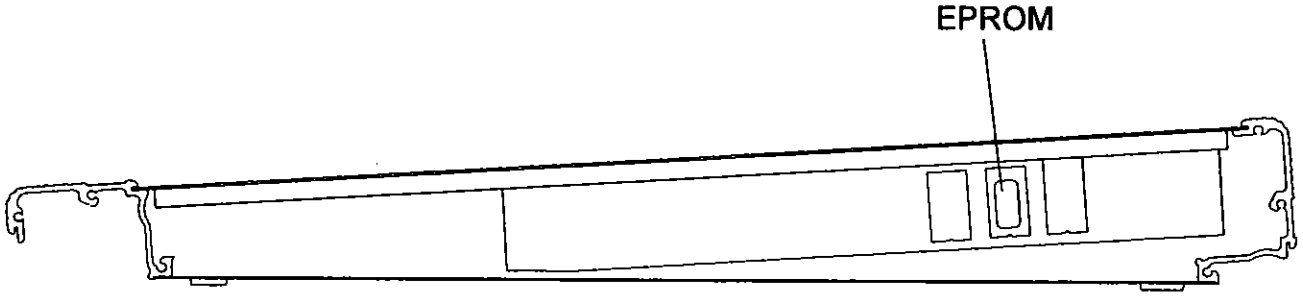
If you need to replace the EPROM, for example to take advantage of a new software release, proceed as follows:

1. Disconnect power from the console.
2. Remove the right hand (master end) side trim. Use a 2-point crosshead screwdriver to remove the three base side screws, and a 4mm hexagonal allen key to remove the six side bolts.
3. Identify and remove the EPROM using a suitable IC extractor tool. Alternatively you may use a small flat screwdriver to lever the EPROM out with care. To do this you may need to slide the front panel sideways so that it slightly overhangs the edge of the console. Note the orientation of pin 1 on the EPROM first before removing it. Then plug in the replacement EPROM.

PRECAUTION: Take care to ensure that the EPROM pins are correctly aligned in the socket holes. Press it in fully and with even pressure. Check that none of the pins are bent out or distorted, and make sure that it is plugged in the right way round.

4. Refit the side trim, connect power and check for correct operation.
5. Log the version and checksum numbers of the replacement EPROM for future reference.

NOTE: You must reset the console defaults after replacing an EPROM. This replaces the settings held previously by the battery backed memory with the new factory defaults. To do this, press and hold the CLEAR key whilst powering up the console. On release the new defaults are operational.



CONSOLE WITH RIGHT HAND SIDE TRIM REMOVED

GS3V EPROM REPLACEMENT

From time to time Allen & Heath will issue software upgrades in the form of a replacement EPROM.

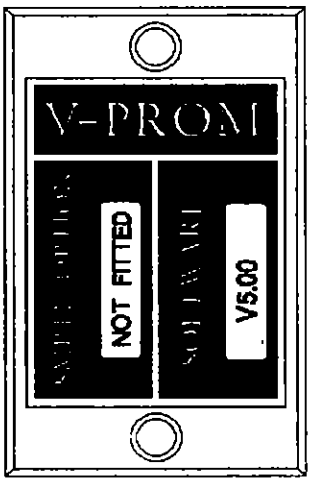
This is located in a compartment beneath the V-PROM cover plate directly below the D.C. power connector . It has a self adhesive label identifying the software version number.

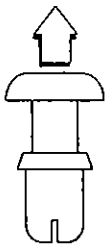
When contacting ALLEN & HEATH; please quote the software version number as well as the console serial number.

NOTE: **You must reset** the console defaults after replacing the EPROM. This replaces the settings stored in the battery backed memory with the new factory defaults. To do this; **press and hold** the **ERASE** switch at power on.

Before commencing; **remember to disconnect the power from your console** then follow the procedure below:

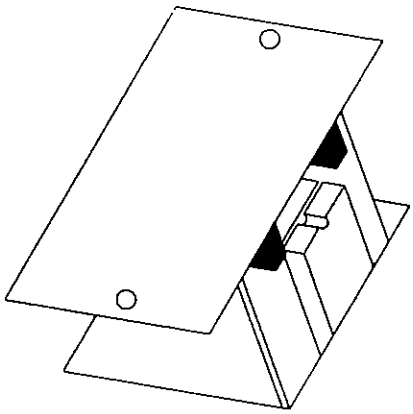
1





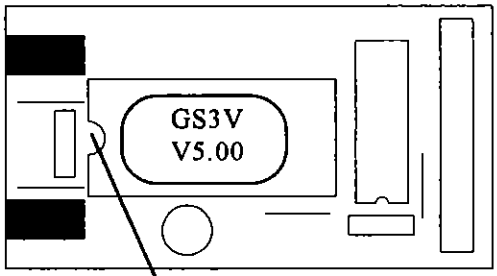
Remove the 2 plastic snap rivets securing the **V-PROM** cover plate to the console front panel.

2



Carefully ease the **V-PROM** module from the console. Take care not to damage the harness connected to the module.

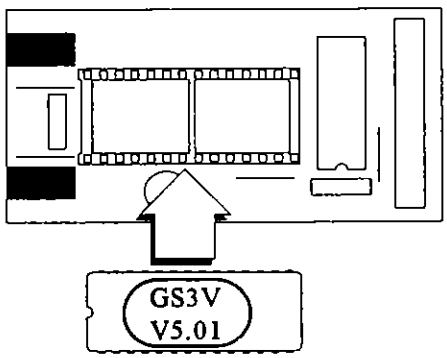
3



Remove the **EPROM** using a suitable IC extractor. Alternatively; you may use a small flat screwdriver to lever the **EPROM** out with care.

4

Check orientation of EPROM



Insert the new **EPROM** ensuring that the orientation is correct and that none of the pins are bent out or distorted. Now reassemble the module in reverse order.

GS3 V5 UPGRADE EPROM REPLACEMENT

The software that runs the V5 VCA AUTOMATION is programmed by ALLEN & HEATH into an EPROM. This is plugged into an IC socket located on the V-PROM PCB which is mounted on the component side of the METER PCB. You may identify it easily as it has a self adhesive label identifying the version number.

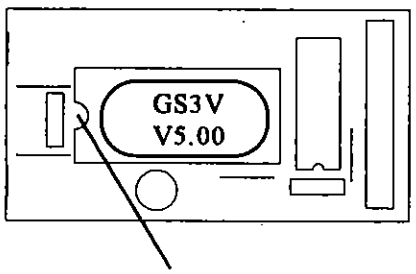
Please quote the version number, as well as the console serial number when discussing the EPROM with ALLEN & HEATH.

If you need to replace the EPROM, for example to take advantage of a new software release, proceed as follows:

1. Disconnect the power supply and all cables from the console.
2. Place the console upside down on a suitable flat surface.

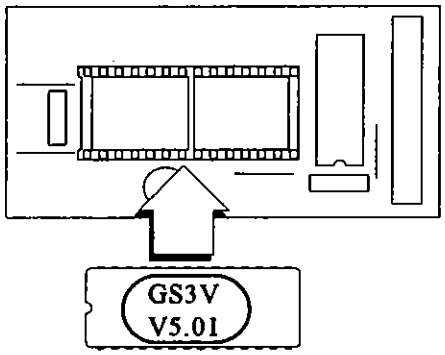
PRECAUTIONS: Make sure that your work surface is clear of dirt and debris which may damage the control knob finish. It is best to place a clean table cloth or foam sheet over the work surface first. Avoid balancing the console on one of its corners as this may damage the trim.

3. Remove the front, rear and side base screws using a 2-point crosshead (Pozidriv) screwdriver. Lift off the base. It may be necessary to prise up the rear of the base using a small flat screwdriver.
4. Locate the V-PROM PCB mounted on the METER PCB.



Note Position of notch

Check orientation of EPROM



5. Remove the **EPROM** using a suitable IC extractor. Alternatively; you may use a small flat screwdriver to lever the **EPROM** out with care.
6. Insert the new **EPROM** ensuring that the orientation is correct and that none of the pins are bent out or distorted.

7. Refit the base. Note the correct orientation, i.e.. the foam tape strip lines up with the SLAVE assembly positions.

PRECAUTION: Do not overtighten the base screws. These self tap into the aluminium extrusions and steel side brackets.

8. Log the version and checksum numbers of the replacement EPROM for future reference.
9. Reconnect the power and cables and test for correct operation.

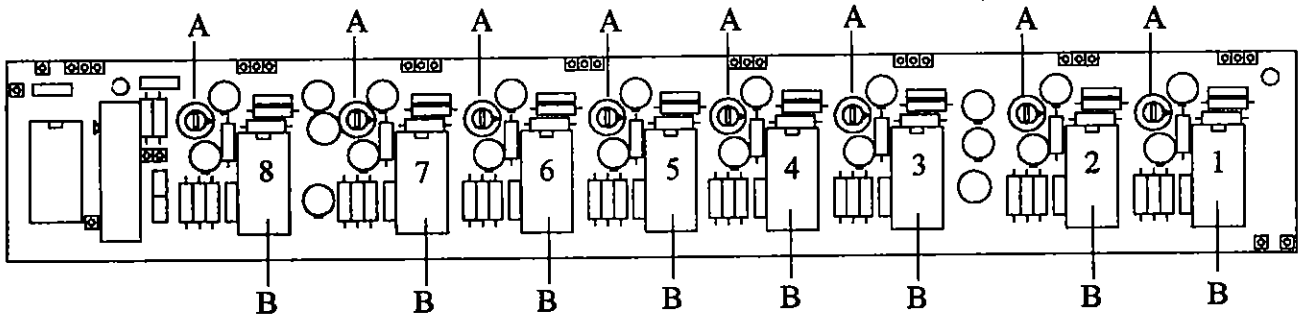
NOTE: You must reset the console defaults after replacing an EPROM. This replaces the settings held previously by the battery backed memory with the new factory defaults. To do this, press and hold the F6 function key whilst powering up the console. On release the new defaults are operational.

VCA CALIBRATION

There are two different types of PCB that require VCA calibration. The Channel VCA PCB has 8 presets (A) used for trimming the harmonic distortion of the 8 VCAs (B) on the PCB. The Keyboard PCB has 2 presets used for trimming the harmonic distortion of the master left & right VCAs. These are factory set and do not normally require any adjustment. The presets (A) are miniature horizontal types situated to the top left of each VCA IC (B).

To calibrate each Channel VCA:

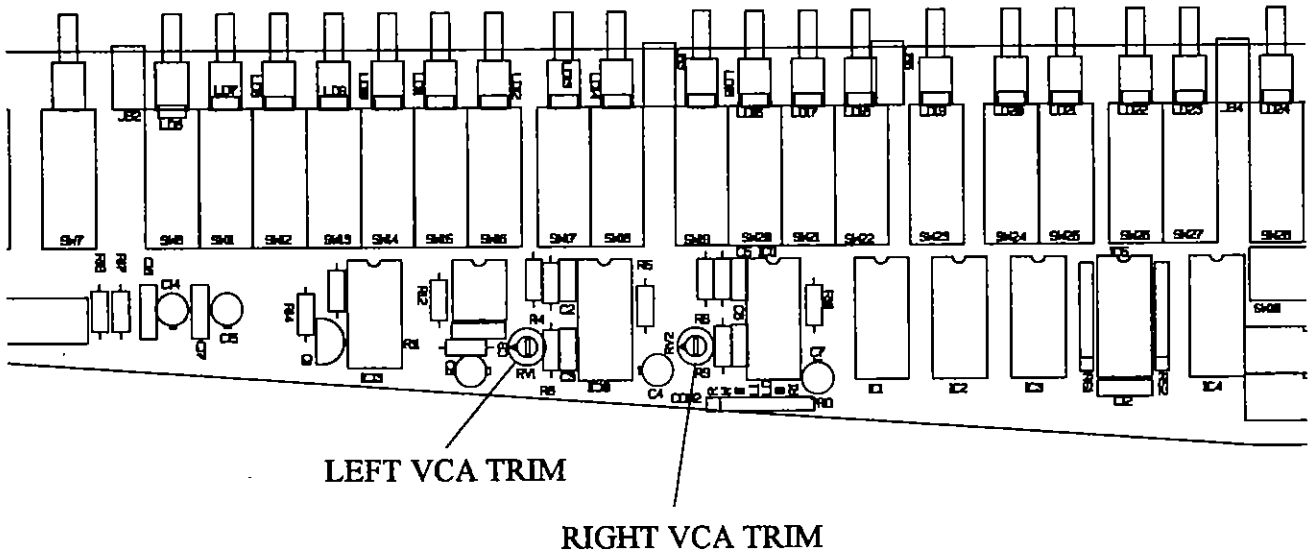
1. Set the fader of the selected Channel at the 0dB level.
2. Connect an unbalanced +10dBu low distortion 1kHz sine wave signal to the LINE IN socket of the Channel.
3. Route the signal to GRP /DIR OUT of the Channel and adjust the input GAIN control until +2dBu is measured at GRP /DIR OUT (+14dBu for high level multi-track option).
4. Adjust the VCA preset (A) until minimum harmonic distortion is obtained (typically 0.005%).



To calibrate the L & R master VCAs:

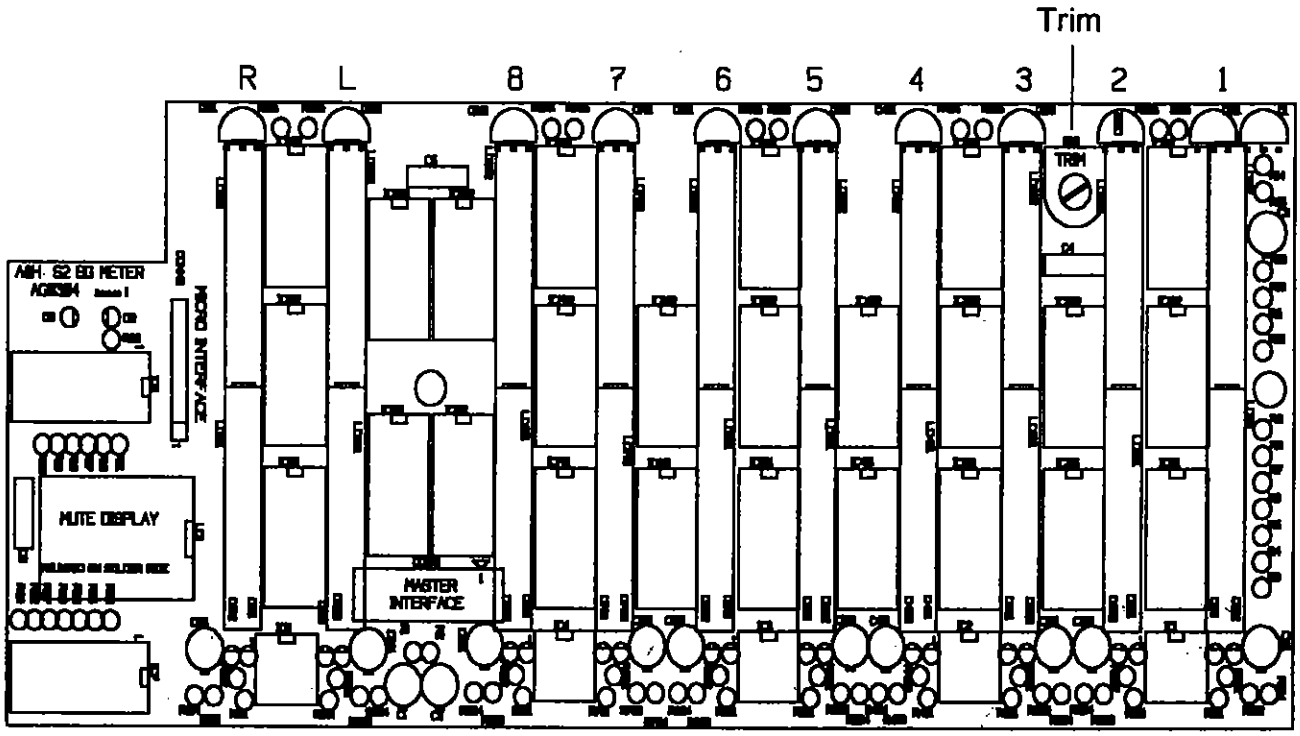
1. Set the master fader at the +10dBu level.
2. Connect an unbalanced +10dBu low distortion 1kHz sine wave signal to the L INSERT socket of the Master section.
3. Route the signal to the 2 TRK TAPE OUT 1 socket. (tip = left, ring = right)
4. Adjust the VCA preset (A) until minimum harmonic distortion is obtained (typically 0.005%).
5. Repeat the procedure for the right VCA by connecting the input signal to the R INSERT.

S3V KEYBOARD PCB



METER CALIBRATION

There is one preset adjustment that sets the operating level of all ten bargraph meters. This is factory set and does not normally require re-adjustment. The preset is a miniature horizontal type situated between meters 2 and 3 on the component side of the DISPLAY circuit assembly. First obtain 316mV rms (-8dBu or -10dBV) from the L-R outputs, and then adjust the preset so that the L-R meters read "0" (first red LED just on). The L-R and group meters will now be correctly set.



COMPONENT AND MODULE REPLACEMENT

Please refer also to the GENERAL SERVICE PRECAUTIONS and how to gain SERVICE ACCESS earlier in this section.

Individual components may be replaced easily by desoldering them from the individual circuit assemblies. To gain access to some you may need to unplug the related connector harness and release the assembly from the front panel to raise it slightly first.

PRECAUTION: Avoid damage to nearby circuits when working on an assembly within the console. In particular, take care not to bend component legs so that they short circuit to each other.

To replace a complete channel assembly (module) first unplug the related connector harnesses and piggy back assemblies (if applicable). Remove the rotary control knobs, potentiometer and connector nuts, and front panel fixing screws. Use a 1-point crosshead screwdriver and 10mm, 11mm, and 15mm nut drivers for this.

PRECAUTIONS: Make sure that the replacement module potentiometers and connectors are correctly aligned in the panel holes before tightening the nuts. Also note that the IO CHANNEL, SLAVE, and GROUP assemblies must be correctly assigned according to their position in the console. Refer to the circuit and component layout diagrams for these details.

NOTES:

The console is at the control centre of most typical audio installations. It provides the link between multitrack and 2-track recorders, amplifiers, processing devices, computer equipment, microphones, instruments etc. through a "highway" of interconnecting cables carrying audio, computer, DC, and AC mains power voltages. If a problem is reported it is often the console that is assumed to be at fault. Our experience has shown that most studio problems are related to faulty cables, equipment matching and control setting, or faulty external equipment, and not the console itself which is designed for continued fault-free performance with no user maintenance.

When a problem is reported it is necessary to isolate the location of the fault within the system. Only when tests have been made to eliminate faults in equipment connected to the console and in the interconnection cables, should you attempt to repair the console.

Note that only technically competent personnel should attempt service work on this console and its power supply unit.

IDENTIFYING THE FAULT

Fault diagnosis is often carried out by telephone with the user, who is often non-technical and needs to be talked through a series of simple tests to identify the symptoms and locate the problem. These include; substitution of cables and/or substitution of equipment at the inputs and outputs. If the console is still suspected as faulty, it is recommended that all of the cables are unplugged from the console, except for the DC power connector and a good pair of headphones. Using the internal 1kHz oscillator and a suitable audio lead, patch across the channels to test for correct circuit operation. This often eliminates problems with system earthing and matching with external equipment. The OWNER MANUAL for this console is written to help the user prevent problems through mismatching, wrong connection etc. The relevant pages are reprinted later in this section so that you may help him through the initial stages of user troubleshooting if required. Further fault-finding tables are also provided. Refer to PART C for full technical information including block schematics, circuit diagrams, component layouts, and other assembly drawings.

Faults may be of a permanent or intermittent nature. If intermittent, try to induce the symptom by flexing cables, wiggling connectors, selective mechanical vibration or flex, and thermal (hot, cold) cycling.

Use substitution of known good circuits to aid identification of the faulty circuit.

QUICK CONSOLE TEST

The console normal operation may be confirmed by these quick and simple tests:

1. Switch on the power supply. The MUTE PROCESSOR DISPLAY should display a "0". A flashing, dead, or different display indicates a fault.
2. Press any PFL switch. The adjacent yellow LED and the red PFL ACTIVE LED should light.
3. Select the OSC TO GRPS switch set for 1kHz to test the group BARGRAPH METERS. These should follow the OSC LEVEL and group fader positions.

If the console fails one or more of these tests, there may be a major DC malfunction which must be repaired before attempting repair of individual sections. If the console fails all tests, then check that power is being supplied to the console.

Below is a list of the the most common audio system faults:

1. EXTERNAL INTERCONNECTIONS

Cable termination breakdown due to; unreliable soldering or twisting, kinking or stressing of leads, and/or connection errors. Hum may be caused by earth loops.

2. EQUIPMENT MATCHING

Problems with level and impedance matching, as well as incorrect control settings.

3. SYSTEM ENVIRONMENT PROBLEMS

Noise and interference caused by the proximity of audio cables and equipment to AC mains and computer equipment.

4. INTERNAL CONNECTIONS

Connectors loose or detached usually due to excessive vibration and handling abuse.
Connectors incorrectly fitted due to poor service work.

5. ELECTRO-MECHANICAL DEFECTS

Fader, potentiometer or switch movements broken or worn.

6. ELECTRONIC COMPONENT DEFECTS

IC, transistor, or other component failure.

TROUBLESHOOTING CHART

FAULT- **CONSOLE DEAD.**

No AC mains supply to the power supply unit.

Check that AC mains is present and supplied to the power supply unit.

Power supply fuse blown.

*Replace with **correct anti-surge type rated fuse.***

Power supply component fault.

Refer to section: THE POWER SUPPLY.

Unplug and test the DC power connector.

Short circuit on DC power rails.

Use a multimeter to test for shorts across the DC rails.

FAULT- **METERS DEAD, CONSOLE OTHERWISE OK.**

Internal Meter ribbon harness not fitted correctly.

Remove console base and check meter ribbon harness connection.

FAULT- **ONE CHANNEL LED NOT WORKING.**

Internal ribbon connector misaligned or not fitted correctly.

Remove console base and check main ribbon harness connection.

Channel component fault.

Refer to SECTION C for relevant circuit diagrams & component layouts.

FAULT- **MUTE PROCESSOR DISPLAY FLASHING "0".**

Memory failure.

See section titled ERRORS in mute automation owner manual.

FAULT- **ALL MUTE SWITCHES NOT WORKING (FROZEN).**

Local mode set to "off".

Set Local mode "on" by pressing the SHIFT key and then pressing the LOCAL key.

Central mute processor fault

Refer to SECTION C for relevant circuit diagrams & component layouts.

FAULT- **ONE OR MUTES NOT WORKING.**

Channels isolated.

Change isolation status or switch console off and on to reset.

Mute Slav fault (likely if a block of 4 channels is dead).

Check that Slave PCBs and harness connectors are correctly fitted.

FAULT- **PATCH 0 AND CONFIGURATION SETTINGS LOST ON POWER UP.**

Battery or memory fault.

GS3: Check that the internal battery measures between 2.8V and 3.6V. This does not normally need replacing as it is trickle charged when the console is powered up. If the console has not been used for several months it is best to leave it powered up for a day or so to recharge.

GS3V & GS3 UPGRADE: As above, but the battery should measure between 2.0V and 2.4V.

FAULT- **INCORRECT MULTITRACK INPUT, OUTPUT AND METER LEVELS.**

Incorrect tape level matching.

Standard factory settings for LOW level (316mV, -10dBV) operation. The I/O channel circuits may be modified for HIGH level (+4dBu) operation. Refer to section: OPTIONS.

FAULT- **2 -TRACK OUTPUT FAULT - DEAD, DISTORTED, or NO RIGHT SIGNAL.**

Incorrect installation cable wiring.

The 2-track inputs and outputs are on three pole (stereo) jacks. Plugging in mono jack leads will short out the right signal. A suitable splitter lead should be used as specified in the AUDIO SYSTEMS OWNER MANUAL.

FAULT- **ALT MONITOR AND/OR STEREO CUE OUT RIGHT SIGNAL DEAD OR DISTORTED.**

Cause as above.

NOTE: These connectors are three pole (stereo).

FAULT- **CHANNEL, GROUP OR L-R SIGNAL DEAD OR DISTORTED.**

Insert not correctly wired, or external processing equipment not switched on.

This may be checked by unplugging the insert.

Worn or faulty Insert socket.

With nothing plugged into the insert socket the signal is internally routed through the socket contacts. Check this by plugging in an unwired 3-pole jack plug and shorting tip (send) to ring (return).

FAULT- **FADER INTERMITTENT OR NOT OPERATIONAL.**

Fader mechanically worn or broken. Or disconnected fader wire.

Check fader wiring and inspect fader for signs of damaged or wear.

FAULT- **EXCESSIVE NOISE (HISS) OR DISTORTION.**

Incorrect level matching, for example connecting to a sensitive amplifier.

FAULT- **EXCESSIVE NOISE (HUM).**

Ground (earth) loop formed due to multiple earth paths.

See section titled EARTHING THE AUDIO SYSTEM in the AUDIO SYSTEMS owner manual.

AC hum field induction. Console or audio cables positioned too close to the power supply unit or other AC mains equipment and cables.

FAULT- **EXCESSIVE NOISE (BUZZ).**

Internal or external computer interference or breakthrough.

Check that the studio computer equipment and associated cables are kept well away from the console and audio cable harnesses.

Check that the console base is earthed through the internal wire strap which connects to the rear extrusion.

FAULT- **EXCESSIVE NOISE .(eg. CLICKS, THUMPS, CRACKLES, POPS)**

Clicks and thumps may be due to excessive circuit DC or offsets.

Refer to SECTION C for relevant circuit diagrams & component layouts.

Crackles and pops may be due to noisy ICs, transistors or resistors.

Refer to SECTION C for relevant circuit diagrams & component layouts.

FAULT- **ALL CHANNEL FADERS, OR 8 CHANNEL FADERS, NON-OPERATIONAL. (GS3V & GS3 V5 UPGRADE ONLY)**

VCA & Fader Slave harnessing from Keyboard PCB incorrectly fitted.

Remove console base and check the VCA ribbon harness connections.

Harnessing from V_Micro PCB to Keyboard PCB incorrectly fitted.

Remove console base and check the switch ribbon harness connections.

FAULT- **PROCESSOR DISPLAY BLANK. (GS3V & GS3 V5 UPGRADE ONLY)**

Harness and/or keyboard connector incorrectly fitted.

Remove console base and check Keyboard PCB to Meter PCB connections.

FAULT- **CHANNEL NULL/EVENT LEDS NON-OPERATIONAL OR INTERMITTENT. (GS3V ONLY)**

LED PCB not connected to Fader Slave PCB.

Check LED PCB mounting pads are soldered to Fader Slave PCB.

FAULT- **CHANNEL FADER MOVES MORE THAN ONE FADER ON V_EDIT. (GS3V & GS3 V5 UPGRADE ONLY)**

Incorrect assignment of Fader Slave PCB(s).

Refer to the GS3V X8 EXPANDER OPTION section in this manual for assignment details.

FAULT- **SYNC LED NOT LIT WHEN PLAYING TAPE.**
(GS3V WITH SMPTE OPTION INSTALLED)

(CONSOLE FAILS TO SYNCHRONISE TO TIME CODE)

1) Check the tape has been striped with time code.

2) Check the timecode signal level is high enough. (see SPECIFICATION)

3) Check the connecting lead between console SMPTE IN/OUT socket and tape machine.

4) Check SMPTE Option has been recognised by the automation system in the console by checking that the Generator is working. (see section on INITIAL SYSTEM CHECK)

5) Check for ground continuity between the console and the tape machine.

6) Check the console has detected the Frame rate of the time code on the tape or generator, by running the console SMPTE generator for a few seconds.

FAULT- **SYNC LED FLASHES ON & OFF AT RANDOM WHEN PLAYING TAPE.**
(GS3V WITH SMPTE OPTION INSTALLED)

(CONSOLE DROPS IN & OUT OF SYNC AT RANDOM)

1) Check the timecode on the tape for signal level variation or "drop out".

FAULT- **PLAY LED DOES NOT FLASH WHEN GENERATOR IS STARTED**
(GS3V WITH SMPTE OPTION INSTALLED)

(CONSOLE FAILS TO RECOGNISE THE SMPTE OPTION)

1) Check SMPTE Option is installed correctly (see section on INSTALLATION).

2) Check the V-PROM software version is V5.03 or later.

If problem persists, call Technical Support.

FAULT- **PLAY LED FLASHES BUT NO TIME CODE IS BEING RECORDED.**
(GS3V WITH SMPTE OPTION INSTALLED)

1) Check the SMPTE lead connections are not reversed.

If problem persists, call Technical Support.

The standard power supply for this console is the external free-standing:

MPS9 POWER SUPPLY UNIT

This unit connects to the local AC mains supply of matching voltage, and provides the regulated DC operating voltages required by the console. The MSP9 DC output lead is terminated in an in-line 5 pin XLR female connector which plugs into the console DC INPUT

SPECIFICATION:

AC MAINS INPUT: 50Hz to 60Hz 200 VA max.

Input is via a standard 1.5 metre long 3-core mains lead.

The AC mains input setting is indicated on the panel label:

setting:		fuse:	
	240V.AC (235-245V)		1 A.T 20mm x 5mm
	220V.AC (210-235V)		1 A.T 20mm x 5mm
	110V.AC (105-120V)		3 A.T 1 1/4" x 1/4"
	100V.AC (96-106V)		3 A.T 1 1/4" x 1/4"

DC OUTPUT: Rectified, smoothed and regulated, linear design

Short circuit protected

Output is via a 4-core 1.5 metre long lead terminated in an in-line 5-pin XLR female connector.

+15V.DC +/- 1V at 2.75 Amps max.

-15V.DC +/- 1V at 2.75 Amps max.

+48V.DC +/- 1V at 0.1 Amps max.

TECHNICAL DESCRIPTION:

The MPS9 is a free-standing unit comprising a folded steel chassis with finned heat sink, and a removable perforated steel cover. The AC mains input voltage is fed through an anti-surge protection fuse, stepped down through a low hum field toroidal transformer, rectified through a full-wave bridge rectifier, smoothed, and regulated by high performance 3-pin IC regulators. The circuit components are mounted on a high grade fibreglass printed circuit board (PCB). The regulators and bridge rectifier are attached to aluminium heat sinks for free-air cooling through the ventilated cover.

AC MAINS INPUT: The AC mains setting and the fuse type of the MPS9 are indicated on its panel label. The unit may be configured for a different input voltage by rewiring the toroidal transformer and changing the fuse value accordingly. If you need to do this please observe the following precautions:

1. **SAFETY!** Mains electricity is dangerous and can kill. Mains voltage is present within this power supply unit. Only technically competent service personnel should attempt service work on this unit.
2. **GOVERNMENT AND INSURANCE UNDERWRITERS ELECTRICAL CODES MUST BE OBSERVED.** These codes take precedence over any suggestions made in this manual.
3. **SWITCH OFF AND DISCONNECT** this power supply unit before removing the cover.
4. **CHECK YOUR MAINS WIRING** and service work before switching on.
5. **REPLACE COVER** before switching on.

THE FUSE The fuse protects the console and power supply unit from irreparable damage in the event of a major component failure. Should the unit draw more than the rated fuse current, the fuse will blow the rated fuse thus isolating the unit from the AC supply.

The correct fuse is a "T" (time delay) or anti-surge type. If it is replaced with a fast blow type it may blow when the unit is switched on due to the "power-up" surge characteristic of linear power supplies. Always use the correct type and rating.

The failure of a fuse of the correct type and rating usually indicates a circuit fault. In rare cases a fuse may fail simply due to fatigue. In this case replacement quickly restores normal operation. If, however, the replacement fuse blows as well this suggests a circuit fault which should be diagnosed and corrected first.

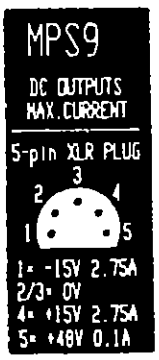
To remove and check the fuse use a flat screwdriver or a small coin to press in and turn the fuse holder insert anti-clockwise. Pull the insert out to access the fuse.

CHECKING FOR NORMAL OPERATION

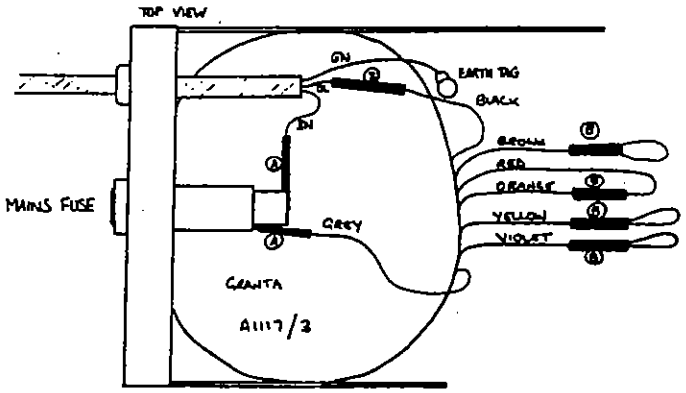
If a power supply fault is suspected, first disconnect the unit from the console and probe the DC lead 5-pin connector for the presence of the correct voltages.

If the voltage rail fails only when the unit is plugged into the console, then a console short circuit may be suspected.

If the power supply itself is proved to be faulty, then the IC regulators and rectifier should be checked first.



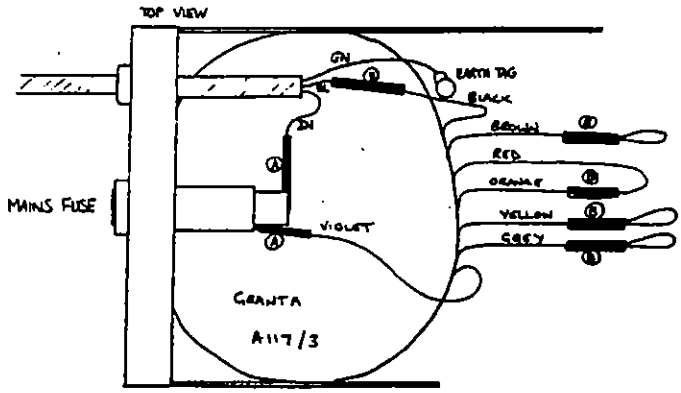
TRANSFORMER AND FUSE SETTINGS FOR AC MAINS



240 V.AC

FUSE = 1 Amp T
20mm x 5mm

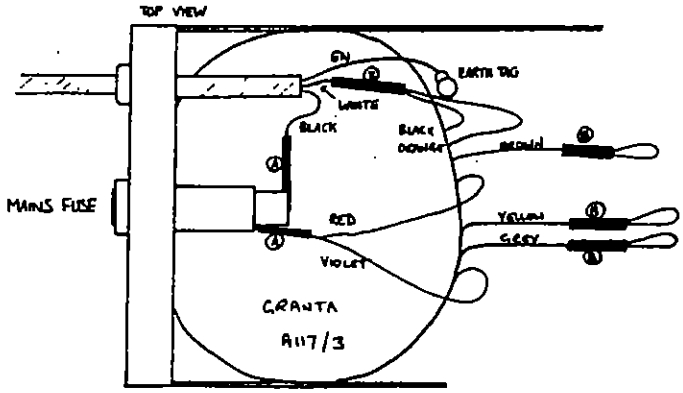
U.K.



220 V.AC

FUSE = 1 Amp T
20mm x 5mm

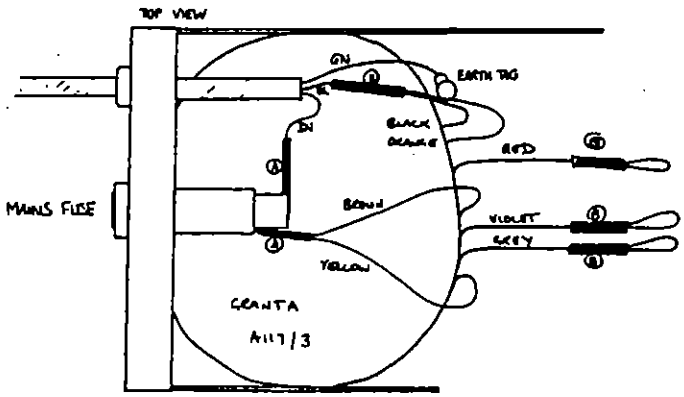
Europe, Ireland



110 V.AC

FUSE = 3 Amp T
1 1/4" x 1/4"

U.S.A, Canada

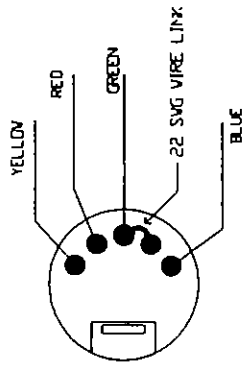


100 V.AC

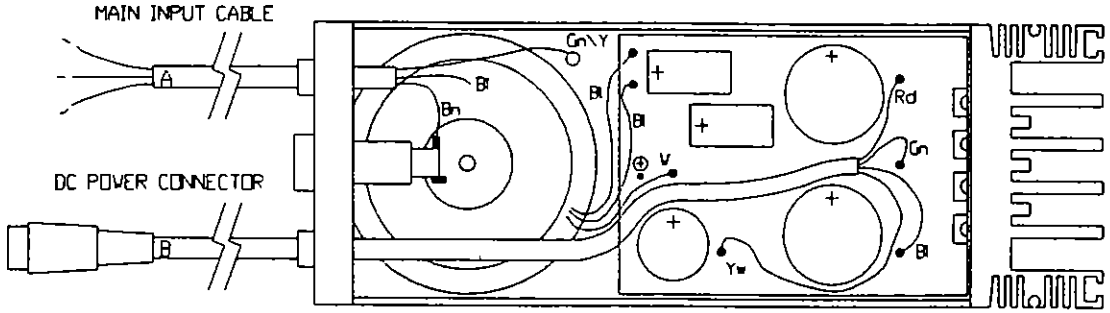
FUSE = 3 Amp T
1 1/4" x 1/4"

Japan

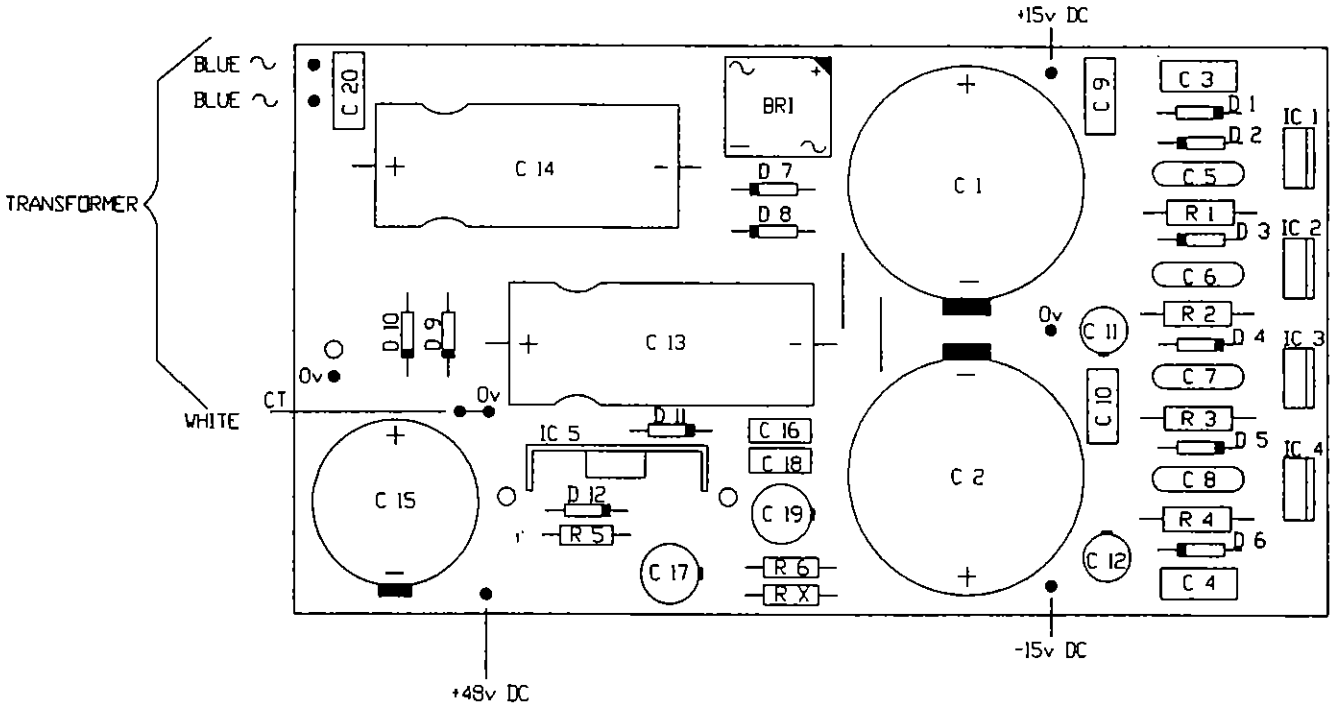
MPS9 ASSEMBLY



CONSOLE
PLUG WIRING
(SOLDERING VIEW)



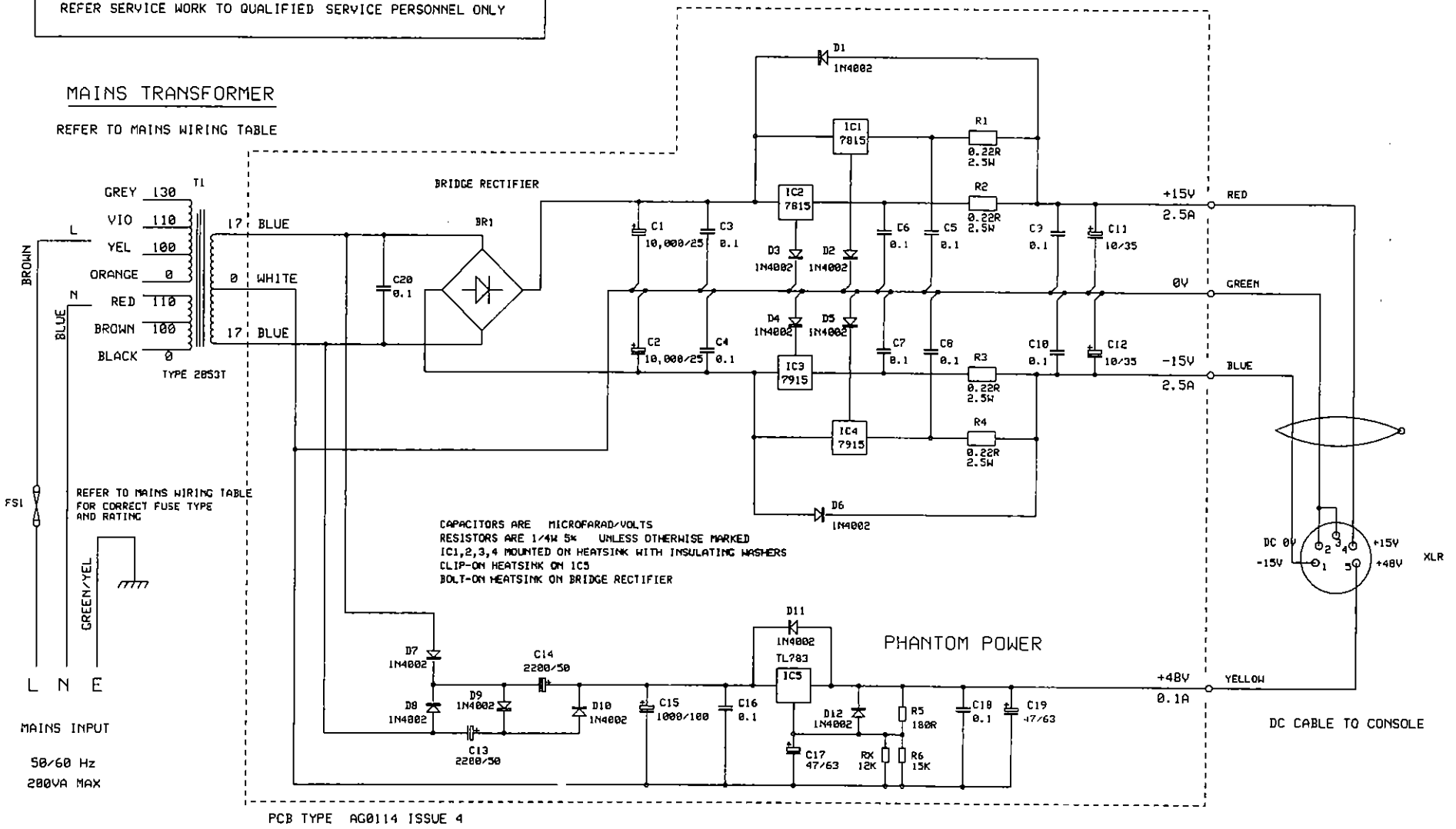
MOUNT IC'S USING INSULATING WASHER & BUSH
USE ONLY M3 X 8mm TAPTITE PAN SCREWS ON HEATSINK
CHECK SCREWS ARE TIGHT WITH GOOD SURFACE CONTACT.



MPS9 PCB AG0114 ISSUE.4
COMPONENT OVERLAY

DANGER - HIGH VOLTAGE !

DISCONNECT POWER BEFORE REMOVING COVER
REFER SERVICE WORK TO QUALIFIED SERVICE PERSONNEL ONLY



ISS.	REVISION	BY DATE
1	REDRAWN FROM MBD122 ISS.5	CD 29-9-92

UNIT TITLE: MPS9 POWER SUPPLY

DRAWING TITLE: CIRCUIT DIAGRAM

MANUFACTURED IN ENGLAND BY
ALLEN & HEATH

DRAWING No. D197 ISSUE 1